सत्यमेव जयते

INDIAN AGRICULTURAL
RESEARCH INSTITUTE, NEW DELHI

I.A.R.I. 6

GIPNLK—4/JDIARI/60—16-3-61—5,000

Public Health Reports

OLUME 63 JANUARY 2, 1948 NUMBER 1

TUBERCULOSIS CONTROL ISSUE NO. 23

IN THIS ISSUE

Editorial—Fiftieth Anniversary

Tub sis Mortality in Major Cities: U. S. 1945

U.S. PUBLIC HEALTH SERVICE
1798

CONTENTS

Page

Editorial—Fiftieth anniversary. Francis J. Weber 1

Tuberculosis mortality in major cities: United States, 1945. Sara A. Lewis and Richard V. Kasius 3

INCIDENCE OF DISEASE

United States:

- Reports from States for week ended December 13, 1947, and comparison with former years 31
- Weekly reports from cities:
  - City reports for week ended December 6, 1947 35
  - Rates, by geographic divisions, for a group of selected cities 37
- Territories and possessions:
  - Panama Canal Zone—Notifiable diseases—October 1947 38
  - Puerto Rico—Notifiable diseases—4 weeks ended November 29, 1947 38

Foreign reports:

- Canada—Provinces—Communicable diseases—Week ended November 22, 1947 39
- Mexico—Guanajuato—Diphtheria 39
- Reports of cholera, plague, smallpox, typhus fever, and y[illegible] fever received during the current week—
  - Cholera 39
  - Plague 40
  - Smallpox 40
  - Typhus fever 40

Deaths during week ended December 6, 1947 40

NOTE

The article "Tuberculosis Case-Finding Survey of the Total Population of Reykjavik, Iceland in 1945," by Sigurdur Sigurdsson and Oli P. Hjaltested, Public Health Reports, Vol. 62, No. 45, November 7, 1947, contained several errors. These should be corrected as follows:

Page 1594, third line from bottom; page 1595, first line; page 1597, third lin should read "1 to 6 years of age."

Page 1603, beginning of second paragraph should read "Table 4 sets out . . ."

Page 1605, first line should read "Tables 5 and 6 set out . . ."

Page 1605, table 4. Column headings should be "per mil" instead of "percent

Public Health Reports

Vol. 63 ● JANUARY 2, 1948 ● *No. 1* *

Printed With the Approval of the Bureau of the Budget, as Required by Rule 42 of the Joint Committee on Printing

EDITORIAL

FIFTIETH ANNIVERSARY

The celebration this year of the fiftieth anniversary of the founding of the first State sanatorium in the United States, at Rutland, Massachusetts, is an event to be viewed with great satisfaction. It directs our attention to the great work which tuberculosis sanatoria everywhere have carried out in the tuberculosis control movement during the past fifty years. These sanatoria have been at the very heart of this public health program, and every day has borne witness to the fruitfulness of their efforts. At one time not so long ago, tuberculosis was believed to be an incurable disease. It remained for the early sanatoria, such as those of Dr. Trudeau at Saranac, and the Rutland Sanatorium, to demonstrate that what was then called "consumption" could be arrested. In and of itself, this discovery was of vast importance; even more than that, however, the sanatorium has provided the means whereby that vital element in tuberculosis control—isolation—can be effected for the protection of the public health.

With time, too, the programs of the sanatoria have broadened to include many activities aside from actual treatment. Material progress has been seen in the inclusion of sanatorium programs of rehabilitation, vocational guidance, medical social service, and research. Further, the out-patient department is rapidly becoming an integral part of sanatoria. Thus, not only has the modern sanatorium succeeded in serving the public interest by the application of isolation techniques—it has, indeed, come to symbolize the hope and possibility for cure in this all-too-costly disease.

Since the founding of the first State sanatorium, communities have come to recognize more and more their responsibility for the support of institutions for the tuberculous. The decision to erect special facilities for the treatment of the tuberculous has been, in fact, a logical expression of the realization that tuberculosis was, and is a public health problem. It is our conviction that the notable decline in tuberculosis mortality in the past 50 years can be attributed in no small measure to the general extension of sanatorium services and to the collective effort of the sanatorium movement. We say this despite the knowledge that many factors have contributed to the decline in tuberculosis mortality, and despite the fact that we do not know with exactness the relative importance of each of these factors.

---

*This is the twenty-third of a series of special issues of PUBLIC HEALTH REPORTS devoted exclusively to tuberculosis control, which will appear the first week of each month. The series began with the Mar. 1, 1946 issue. The articles in these special issues are reprinted as extracts from the PUBLIC HEALTH REPORTS. Effective with the July 5, 1946, issue, these extracts may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 10 cents a single copy. Subscriptions are obtainable at $1.00 per year; $1.25 foreign.

The nation's sanatoria, working hand-in-hand with all official agencies and voluntary organizations interested in the public health, have furthered the national control program markedly, and will continue to play an important role in the success of future programs. We can expect that demands on these institutions will increase with the acceleration of case-finding programs.

In order to secure past gains in tuberculosis control, much remains to be done. It is up to public health workers to see to it that patients are referred to sanatoria for prompt treatment; it is up to the community to see that facilities are provided in sufficient quantity to meet the needs of all who require such care. Even now, mass case-finding programs are highlighting our need for some 50,000 additional beds for the tuberculous in the United States. These beds must be furnished with the utmost speed. Moreover, the means test as a condition for sanatorium admission must be abolished universally if we are to provide treatment for all requiring it. Adequate assistance for families of the tuberculous must be assured—for tuberculosis remains the leading cause of death in the 15 to 44-year age group, where family responsibility is greatest. Immediate and prompt action in these directions is requisite to the success of our national tuberculosis control program—failure to take the necessary action will in the long run prove to be poor economy.

If the implications of tuberculosis are today less terrifying and less desperate than they were 50 years ago, credit must go generously to the men and women of the sanatorium movement. Could we, indeed, bring to all phases of the tuberculosis control program the courage, singleness of purpose, and devotion to the cause of public health which these people have brought to their work, the very near future would witness the final and utter defeat of a disease already in retreat.

FRANCIS J. WEBER, *Medical Director,*
Chief, Tuberculosis Control Division.

TUBERCULOSIS MORTALITY IN MAJOR CITIES: UNITED STATES, 1945

By Sara A. Lewis [1] and Richard V. Kasius [2]

Of the 52,916 deaths from tuberculosis in the United States in 1945, 19,463, or 36.8 percent, were among residents of the 92 cities which had a population of 100,000 or more in 1940. The number of tuberculosis deaths among residents of the large cities, and the percent they form of tuberculosis deaths in the country as a whole, were 19,873 and 36.3 in 1944, an annual average of 20,529 and 35.8 in 1942–43, and an annual average of 20,953 and 34.7 in 1939–41. These data indicate a small but steady increase in the large cities' share of the national tuberculosis problem.

This is another in the series of reports on tuberculosis mortality in the large cities which have been issued by the United States Public Health Service [3] or jointly by the United States Public Health Service and the Bureau of the Census.[4] Its purpose is to present data for 1945 on the mortality from tuberculosis by age, race, and sex for the 92 cities with a population of 100,000 or more in 1940. All data are by place of residence and exclude deaths among the armed forces overseas.

Because population estimates necessary for computing death rates are not available, further use is made in this report of the tuberculosis death ratio, or proportionate mortality. This measure expresses the number of deaths from tuberculosis per 100 deaths from all causes and is used as an index of the relative importance of tuberculosis as a cause of death.

From a comparison of the tuberculosis death ratio for one community with that for another, it is possible to determine the difference between the two communities with respect to the importance of tuberculosis as related to the total mortality problem. The movement of the tuberculosis death ratio over a period of time for a given community reveals the course of the tuberculosis death rate relative to the general death rate. If the ratio increases, the tuberculosis death rate is either rising faster or decreasing more slowly than is the general death rate; if it remains constant, the two are following the same course; if the ratio decreases, the tuberculosis death rate either has dropped more rapidly or has risen more slowly than has the total death rate.

---

[1] From the National Office of Vital Statistics, United States Public Health Service.

[2] From the Tuberculosis Control Division, United States Public Health Service.

[3] Liveright, Dorothy: Tuberculosis Mortality among Residents of the 92 Cities of 100,000 or more Population, United States, 1939–41, Pub. Health Rep., 59: 942–955 (1944).

Pitney, E. H., and Kasius, R. V.: Tuberculosis Mortality in Major Cities: United States, 1944, National Office of Vital Statistics, Vital Statistics-Special Reports, vol. 25, no. 10, pp. 165–195 (1946); also Pub. Health Rep., 61: 1443–1454 (1946).

[4] Kasius, R. V., and Pitney, E. H.: Tuberculosis Mortality in Major Cities, United States, 1942-43, Bureau of the Census, Vital Statistics-Special Reports, vol. 21, no. 14, pp. 235–281 (1945); also Pub. Health Rep. 61: 297–312 (1946).

TABLE 1.—*Death ratios for tuberculosis (all forms) by age, race, sex, and population-size groups: United States, 1945*

[By place of residence. Ratios are the number of deaths from tuberculosis per 100 deaths from all causes]

Race and population-size group	Total	Male							Female						
		All ages [1]	Under 15	15-24	25-34	35-44	45-64	65 and over	All ages [1]	Under 15	15-24	25-34	35-44	45-64	65 and over
United States:															
All races	3.8	4.2	1.2	11.9	16.3	12.2	5.4	1.4	3.3	1.7	25.2	20.5	9.1	2.6	0.8
White	3.1	3.6	.9	7.9	13.5	11.1	5.2	1.3	2.5	1.3	18.6	17.9	8.5	2.4	.8
Nonwhite	8.5	8.7	2.8	28.0	25.5	16.4	7.4	2.3	8.3	3.7	40.4	27.1	10.9	3.4	1.1
Cities of 100,000 or more:															
All races	4.4	5.2	1.8	16.4	19.9	14.2	6.0	1.7	3.3	2.4	31.6	22.2	8.8	2.1	.5
White [2]	3.5	4.4	1.4	10.4	16.6	12.6	5.5	1.6	2.4	1.6	22.0	18.3	7.8	1.9	.5
Nonwhite [3]	11.1	11.9	4.0	35.8	29.4	20.0	9.4	3.4	10.3	6.1	51.4	31.9	11.9	3.3	1.1
Places under 100,000:															
All races	3.5	3.7	1.1	10.6	14.7	11.0	5.1	1.3	3.2	1.5	22.6	19.6	9.3	2.8	.9
White [4]	3.0	3.3	.8	7.4	12.5	10.3	5.0	1.2	2.7	1.2	17.8	17.8	8.9	2.7	.9
Nonwhite [4]	7.2	7.1	2.4	24.6	23.2	13.7	6.1	1.9	7.3	2.9	34.8	24.4	10.4	3.5	1.1

[1] Includes age not stated.

[2] Based on data including deaths of nonwhite residents of cities having small nonwhite populations (less than 20,000 or less than 10 percent according to the 1940 census).

[3] Based on data for only those cities in which the nonwhite population constitutes at least 10 percent of the total population or numbers 20,000 or more according to the 1940 census.

[4] The distribution of deaths by age, race, and sex for places under 100,000 population was obtained by taking the difference between the distributions for the United States and for the group of cities of 100,000 or more population. It was necessary to estimate the latter distribution in part because deaths of residents of the 52 cities having small nonwhite populations were not available by age for the two race groups separately. However, since the numbers of deaths at all ages for this group of 52 cities were available by race and sex it was possible to correct the distributions of the total white and nonwhite deaths for the group of 92 cities. Correction was made on the assumption that deaths of the nonwhite residents of the 52 cities were distributed by age proportionate to the age distribution of deaths of nonwhites in the other 40 cities.

Among the important factors affecting the death ratio are the general mortality and the composition of the population with respect to age, race, and sex. A community with a large proportion of its population at the younger ages, where the number of deaths from all causes is relatively small, may have a rather high tuberculosis death ratio; while an area having a large proportion of its population at the older ages, where the number of deaths from all causes is large, may have a rather low death ratio. Thus, in some cases, tuberculosis death ratios may differ because of differences in the composition of the populations rather than because of any real difference in tuberculosis mortality. The effect of such differences may be controlled in large measure by the use of death ratios specific for age, race, and sex. A more extended discussion of the interpretation and limitations of the death ratio has been presented in an earlier report.[4a]

Tuberculosis mortality by age, race, and sex.—Table 1 and figure 1 present the number of deaths from tuberculosis per 100 deaths from all causes in 1945 among residents of the 92 cities, by age, race,[5] and sex. The age curves of the tuberculosis death ratios in that year for each race-sex group are typical of those seen in previous years. The ratios rise steeply from a relatively low level at the youngest ages, reach their highest points during the young adult years, and recede through middle and old age.

In figure 1 the magnitude of tuberculosis proportionate mortality for the young adult portion of the population is immediately observed. The white male population of the 92 major cities experienced its greatest relative mortality from tuberculosis (16.6 percent of all deaths) in the age group 25 to 34 years, while the tuberculosis death ratio among white females residing in these areas was highest (22.0) in the 15 to 24 age group. For the nonwhite races, the proportion of deaths resulting from tuberculosis reached its maximum point for both sexes in the age group 15 to 24. In the major cities in 1945, 35.8 percent of all deaths among nonwhite males between 15 to 24 years of age were attributed to tuberculosis, and among nonwhite females at these ages this cause accounted for 51.4 percent of the total deaths, or more than all other causes combined.

While tuberculosis is of greater relative importance as a cause of death among females than among males at the younger ages, the tuberculosis death ratios for both white and nonwhite males are higher than those for white and nonwhite females in the age groups 35 to 44 and over, and at these ages the tuberculosis death ratios decline faster among females than among males.

[4a] See footnote 4 on page 3.

[5] Deaths have been tabulated by race for only those 40 cities in which the nonwhite population numbered at least 20,000 or constituted 10 percent of the total population, according to the 1940 census. Deaths of nonwhite residents of the 52 major cities having small nonwhite populations (less than 20,000 or less than 10 percent, according to the 1940 census) are included with those for whites. The inclusion of these deaths (542 from tuberculosis and 5,063 from all causes) results in an overstatement of the tuberculosis death ratio or white residents of the group of 92 cities amounting to 0.1 per 100 deaths from all causes.

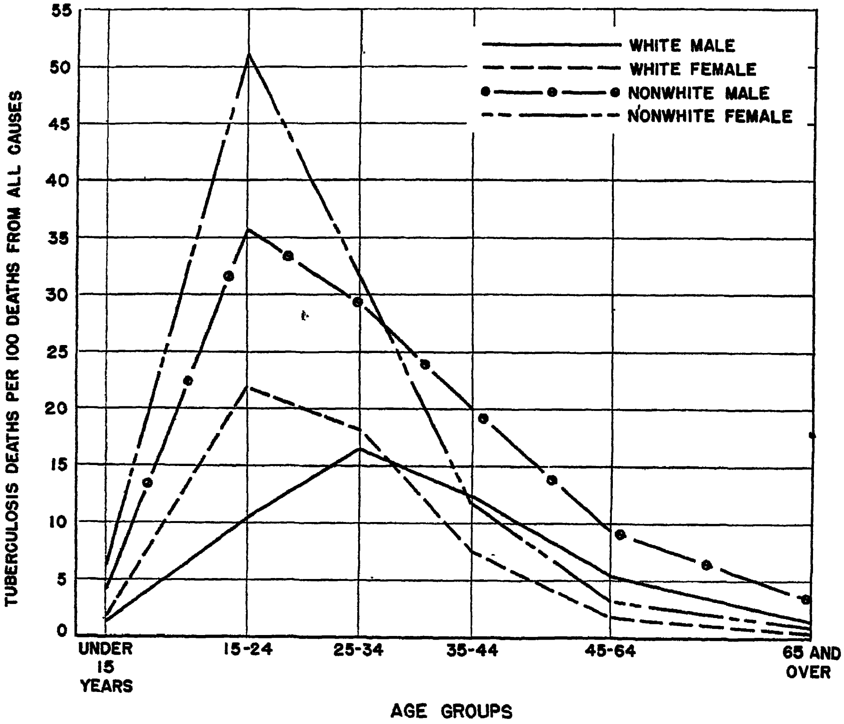


FIGURE 1.—Death ratios for tuberculosis (all forms) by age, race, and sex, for residents of cities of 100,000 or more: United States, 1945.

Community-size.—Table 1 also compares the proportionate mortality from tuberculosis for all residents of the 92 largest cities with that for the combined populations of smaller cities and rural areas. (The race-specific ratios shown in table 1 for places under 100,000 population are based in part on estimated data.[6])

It may be seen that tuberculosis presents a greater problem in the largest cities for white and nonwhite males in each age group. At the younger ages, the mortality ratios for female residents of the major urban areas also compare unfavorably with those for females in the remainder of the country. However, an inverse relationship between community-size and the tuberculosis death ratio appears among white women in the age groups 35 to 44 and over, and among nonwhite women in the age group 45 to 64, while no difference is seen among nonwhite women 65 years of age and older.

The difference observed between the relative importance of tuberculosis as a cause of death in the major cities and in the remainder of the country can, to some extent, be attributed to differences in occupation and to factors associated with residence in large urban areas, such as the greater contact among residents and, hence, the possibility of more frequent exposure to infection. Of particular interest is the difference seen in the mortality experience of younger and older women. These findings agree with those of Yerushalmy and Silverman, who observed a similar association between community-size and tuberculosis death rates for 1940.[7]

---

[6] See footnote 4 to table 1.

In considering these data on tuberculosis mortality recorded for residents of large cities and smaller communities, differences in the reporting of cause of death in these areas must be borne in mind. More widespread use of medical facilities in metropolitan areas probably increases the accuracy of judgment regarding causes of death and may affect the frequency with which a diagnosis of tuberculosis is made.

1939 to 1945.—The rapid expansion of industrial activity which began in 1939 and which resulted in longer working hours, increased employment among women, housing shortages, and other difficult living conditions, gave reason to fear an increase in tuberculosis in urban areas during the war years. In order to compare tuberculosis mortality in the major cities in the prewar "national defense" period, 1939–41, with the period of full participation in the war, 1942–44, and the last year of the war, 1945, the tuberculosis death ratios, the number of deaths from tuberculosis, and the number of deaths from all causes recorded for residents of these areas during these periods of time have been summarized in table 2 and in figure 2. For the 3-year periods 1939–41 and 1942–44, the average annual number of deaths are shown. Data for 1944 are included in the table to facilitate comparison with those for 1945.

These data show that the course of proportionate mortality from tuberculosis for the total population of the major cities was favorable during the years 1939 to 1945, the ratio of tuberculosis deaths to deaths from all causes having decreased for each of the four race-sex groups. Greater percentage declines were recorded for both white and nonwhite females (20.0 and 14.9 respectively) than for either white or nonwhite males (6.4 and 12.5 respectively), with white females showing the greatest, and white males the least, relative improvement.

In interpreting changes in tuberculosis proportionate mortality, it is important to bear in mind that a decrease in the death ratio indicates that mortality from this cause is increasing more slowly, or declining more rapidly, than is mortality from all causes, and does not necessarily reflect a "true" decrease in the incidence of mortality from tuberculosis as measured by the tuberculosis mortality rate. It is, therefore, necessary to consider the course of total mortality and the differences in the number of tuberculosis deaths, in addition to the changes seen in the tuberculosis death ratios. For example, the decrease in tuberculosis proportionate mortality noted for white males represented a very small decrease of 0.3 percent in the number of tuberculosis deaths (from 9,663, the average annual number of

---

[7] Yerushalmy, J., and Silverman, C.: Tuberculosis Mortality in Communities of Different Size, American Review of Tuberculosis, vol. LI, no. 5 (May 1945).

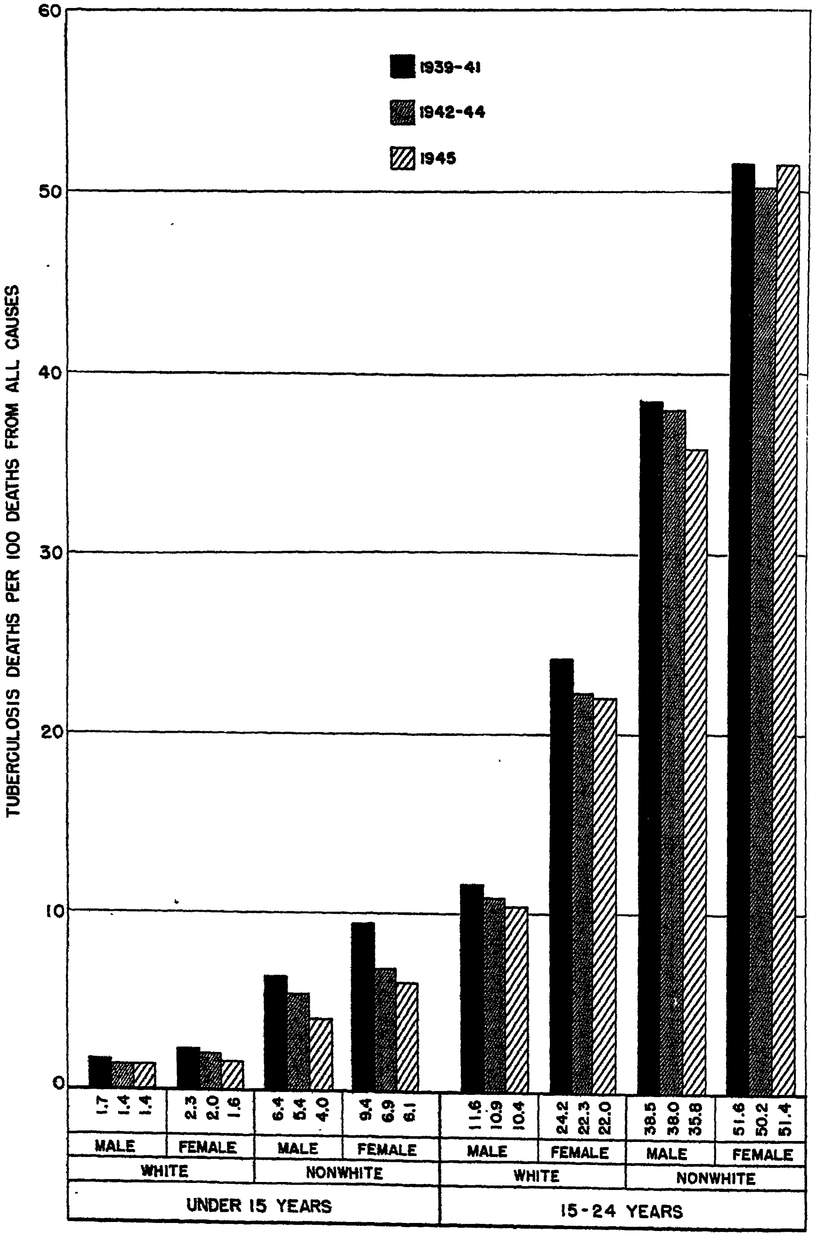


FIGURE 2.—Death ratios for tuberculosis (all forms) for residents of cities of 100,000 or more, by age, race, and sex: United States, 1939-41, 1942-44, 1945.

deaths during 1939–41, to 9,631 in 1945) relative to an increase of 7.3 percent in total mortality. Decreases in the number of deaths from tuberculosis and increases in the number of deaths from all causes from 1939–41 to 1945 were also recorded for the other three race-sex groups.

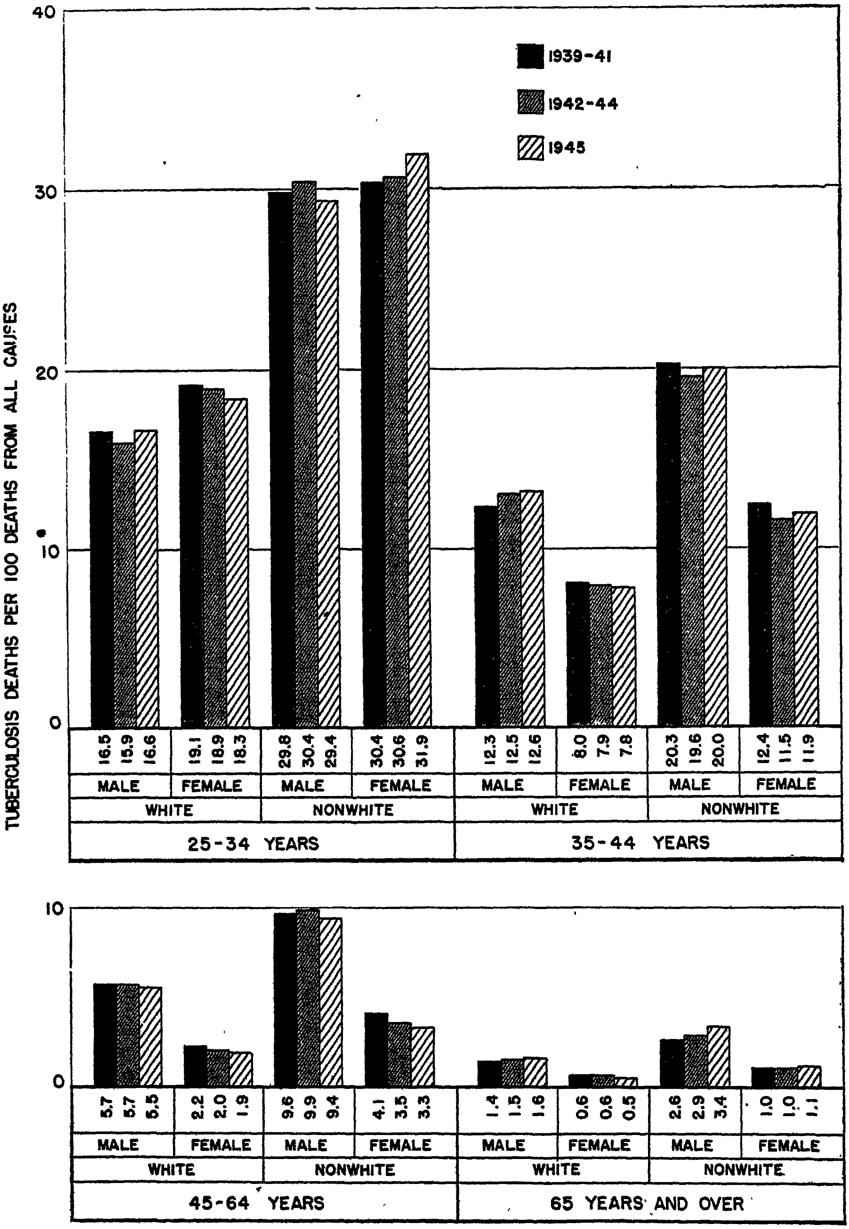


FIGURE 2.—Death ratios for tuberculosis (all forms) for residents of cities of 100,000 or more, by age, race, and sex: United States, 1939–41, 1942–44, 1945.—Continued

TABLE 2.—*Death ratios and number of deaths from tuberculosis (all forms) and number of deaths from all causes, by age, race, and sex, for cities of 100,000 or more: United States, 1939–41, 1942–44, 1944, and 1945*

[By place of residence. Ratios are the number of deaths from tuberculosis per 100 deaths from all causes]

Year and race	Total	Male							Female						
		All ages[1]	Under 15	15 to 24	25 to 34	35 to 44	45 to 64	65 and over	All ages[1]	Under 15	15 to 24	25 to 34	35 to 44	45 to 64	65 and over
	Death ratios														
All races:															
1945	4.4	5.2	1.8	16.4	19.9	14.2	6.0	1.7	3.3	2.4	31.6	22.2	8.8	2.1	0.5
1944	4.5	5.3	2.0	17.9	20.1	14.5	6.1	1.6	3.5	2.8	31.5	22.1	8.8	2.1	.6
1942–44	4.6	5.4	2.0	17.3	19.6	14.0	6.2	1.6	3.6	2.8	31.1	22.2	8.9	2.2	.6
1939–41	5.0	5.7	2.5	17.7	19.9	14.1	6.2	1.5	4.1	3.6	32.5	22.2	9.1	2.5	.6
White:[2]															
1945	3.5	4.4	1.4	10.4	16.6	12.6	5.5	1.6	2.4	1.6	22.0	18.3	7.8	1.9	.5
1944	3.6	4.4	1.4	10.9	16.5	13.0	5.7	1.5	2.5	2.0	22.5	18.8	7.9	1.9	.6
1942–44	3.6	4.5	1.4	10.9	15.9	12.5	5.7	1.5	2.6	2.0	22.3	18.9	7.9	2.0	.6
1939–41	3.9	4.7	1.7	11.6	16.5	12.3	5.7	1.4	3.0	2.3	24.2	19.1	8.0	2.2	.6
Nonwhite:[3]															
1945	11.1	11.9	4.0	35.8	29.4	20.0	9.4	3.4	10.3	6.1	51.4	31.9	11.9	3.3	1.1
1944	11.5	12.5	5.4	39.2	30.1	19.9	9.7	2.6	10.5	6.7	49.4	30.0	11.4	3.3	1.1
1942–44	11.8	12.8	5.4	38.0	30.4	19.6	9.9	2.9	10.6	6.9	50.2	30.6	11.5	3.5	1.0
1939–41	12.9	13.6	6.4	38.5	29.8	20.3	9.6	2.6	12.1	9.4	51.6	30.4	12.4	4.1	1.0
	Deaths from tuberculosis (all forms)														
All races:															
1945	19,463	12,864	372	851	1,677	2,601	5,675	1,685	6,599	368	1,495	1,788	1,207	1,212	527
1944	19,873	12,982	432	961	1,689	2,647	5,716	1,531	6,891	450	1,545	1,871	1,233	1,219	573
1942–44[4]	20,310	13,212	436	1,027	1,817	2,678	5,719	1,529	7,098	458	1,617	1,919	1,248	1,284	570
1939–41[4]	20,953	13,195	478	1,129	2,106	2,782	5,357	1,337	7,758	517	1,867	2,079	1,321	1,396	576
White:[2]															
1945	13,753	9,631	232	412	1,027	1,823	4,634	1,500	4,122	194	700	1,046	782	927	473
1944	14,036	9,634	241	442	1,012	1,858	4,675	1,402	4,402	255	736	1,132	807	951	521
1942–44[4]	14,322	9,756	244	495	1,096	1,867	4,668	1,382	4,566	259	792	1,179	819	996	520
1939–41[4]	14,664	9,663	273	572	1,284	1,893	4,417	1,220	5,001	269	975	1,285	856	1,082	533
Nonwhite:[3]															
1945	5,710	3,233	140	439	650	778	1,041	185	2,477	174	795	742	425	285	54
1944	5,837	3,348	191	519	677	789	1,041	129	2,489	195	809	739	426	268	52
1942–44[4]	5,988	3,456	192	532	721	811	1,051	147	2,532	199	825	740	429	288	50
1939–41[4]	6,289	3,532	205	557	822	889	940	117	2,757	248	892	794	465	314	43

	Deaths from all causes														
All races:															
1945	447,035	247,913	20,496	5,186	8,411	18,331	95,097	100,268	199,122	15,189	4,731	8,038	13,652	58,081	99,399
1944	442,915	244,079	21,155	5,381	8,397	18,313	93,294	97,383	198,836	15,973	4,906	8,475	13,956	57,624	97,852
1942-44 [4]	445,620	246,093	21,549	5,951	9,285	19,068	92,766	97,299	199,527	16,148	5,192	8,659	14,100	58,004	97,365
1939-41 [4]	421,901	231,583	19,174	6,364	10,558	19,773	86,785	88,823	190,318	14,350	5,753	9,348	14,447	56,393	89,976
White: [2]															
1945	395,727	220,636	16,991	3,959	6,202	14,445	84,069	94,867	175,091	12,349	3,183	5,715	10,075	49,467	94,279
1944	392,251	217,228	17,588	4,058	6,148	14,343	82,573	92,386	175,023	13,049	3,269	6,008	10,234	49,430	92,989
1942-44 [4]	394,755	219,012	18,007	4,551	6,911	14,931	82,178	92,285	175,743	13,277	3,550	6,240	10,362	49,787	92,479
1939-41 [4]	373,136	205,550	15,951	4,916	7,799	15,389	77,019	84,394	167,586	11,724	4,025	6,734	10,692	48,698	85,674
Nonwhite: [3]															
1945	51,308	27,277	3,505	1,227	2,209	3,886	11,028	5,401	24,031	2,840	1,548	2,323	3,577	8,614	5,120
1944	50,664	26,851	3,567	1,323	2,249	3,970	10,721	4,997	23,813	2,924	1,637	2,467	3,722	8,194	4,863
1942-44 [4]	50,865	27,081	3,542	1,400	2,374	4,137	10,588	5,014	23,784	2,871	1,642	2,419	3,738	8,217	4,886
1939-41 [4]	48,765	26,033	3,223	1,448	2,759	4,384	9,766	4,429	22,732	2,626	1,728	2,614	3,755	7,695	4,302

---

[1] Includes deaths for which age was not stated.

[2] Includes deaths of nonwhite residents of cities having small nonwhite populations (less than 20,000 or less than 10 percent according to the 1940 census).

[3] Based on data for only those cities in which the nonwhite population consitutes at least 10 percent of the total population or numbers 20,000 or more according to the 1940 census.

[4] Average annual number of deaths:

NOTE.—Data for Camden, Charlotte, and Sacramento, included for 1940-1945. Data for Dayton, by race, included for 1942-45.

Each age group did not share equally in the declines noted above. For both sexes, the largest relative decreases in proportionate mortality from tuberculosis were experienced at the youngest ages (under 15). Among white and nonwhite males 25–34 years and 35–44 years of age, and among nonwhite females 15–24 and 25–34 years of age, the tuberculosis death ratios remained generally stable, and the course of tuberculosis proportionate mortality for these age groups compared unfavorably with that for almost all other age groups, except 65 years of age and older. White females experienced the smallest relative decrease in tuberculosis proportionate mortality between the ages of 35 and 44.

In considering the relative declines in the tuberculosis death ratios from 1939–41 to 1945, a distinct difference between the sexes appears for the age groups 15–24 years and 45–64 years. The relative decrease in the ratio for males in the age group 15–24 (7.3 percent) exceeded that for the age group 45–64 (3.2 percent). Among females, on the other hand, proportionate mortality from tuberculosis decreased much more rapidly between the ages of 45 to 64 (16.0 percent) than in the age group 15–24 (2.8 percent). The decrease in the ratios from 1939–41 to 1945 noted for males 45–64 years of age resulted from a smaller relative increase in the number of deaths from tuberculosis (5.9 percent) than in the number of deaths from all causes (9.6 percent).

In contrast to the changes observed among persons in the age groups under 65 years, tuberculosis proportionate mortality was increasing among the oldest residents of the 92 cities. For white males, nonwhite males and nonwhite females, 65 years of age and over, increases were recorded in the number of deaths from tuberculosis and from all causes, and as seen in the rising death ratios, tuberculosis mortality was increasing more rapidly than was total mortality. Among white female residents in this age group, however, decreases in both the number of tuberculosis deaths and the death ratios may be observed.

Size of city and geographic area.—The relative importance of tuberculosis as a cause of death in different areas and in cities of different size should be considered in planning public health programs. In order to examine these factors, the data for the total white population of the 92 major cities, and for the total nonwhite population of the 40 cities for which statistics by race are available, have been consolidated in table 3 into four population-size groups and into four geographic regions. Death ratios adjusted for age [8] by city-size group for all regions, and by region for all sizes of cities, are also presented in the table and in figures 3 and 4. Figure 3 summarizes the data by population-size of city for all regions, and figure 4 summarizes those by region for cities of all sizes. Age-adjusted ratios for each city-size

---

[8] Adjusted on the basis of the age distribution of deaths from all causes among all residents of the 92 cities in 1945.

TABLE 3.—*Death ratios from tuberculosis (all forms) by race, sex, population-size of city, and geographic area, for cities of 100,000 or more: United States, 1945*

[By place of residence. Ratios are the number of deaths from tuberculosis per 100 deaths from all causes]

Race and population-size of city	Total		Male						Female					
			All areas		North-east	Middle West	South	Far West	All areas		North-east	Middle West	South	Far West
	Ad-justed [2]	Unad-justed	Ad-justed [2]	Unad-justed					Ad-justed [2]	Unad-justed				
White: [1]														
Adjusted [2]	3.8	----------	4.5	----------	4.8	4.1	4.5	4.8	2.7	----------	2.7	2.6	2.9	2.8
Unadjusted	----------	3.5	----------	4.4	4.6	4.0	4.6	4.3	----------	2.4	2.2	2.3	2.8	2.5
1,000,000 or more	3.8	3.6	4.6	4.6	4.6	4.6	----------	4.6	2.6	2.2	2.0	2.4	----------	2.7
500,000–1,000,000	4.2	3.9	4.9	4.8	5.5	4.2	4.7	5.0	3.1	2.6	3.0	2.3	2.4	2.9
200,000–500,000	3.8	3.5	4.4	4.3	4.4	3.7	5.1	4.3	2.9	2.6	2.2	2.3	3.4	2.5
100,000–200,000	3.1	2.8	3.6	3.5	4.0	2.5	3.7	3.0	2.3	2.1	2.2	1.8	2.3	1.8
Nonwhite: [3]														
Adjusted [2]	7.0	----------	8.4	----------	10.5	8.5	6.8	10.8	5.3	----------	6.6	5.5	4.2	6.7
Unadjusted	----------	11.1	----------	11.9	14.9	12.2	9.5	14.8	----------	10.3	12.7	11.0	8.4	12.0
1,000,000 or more	8.5	13.9	10.1	14.8	15.1	14.2	----------	14.9	6.5	12.9	12.8	13.6	----------	10.2
500,000–1,000,000	7.7	11.6	9.3	12.7	13.7	9.8	13.9	14.6	5.6	10.2	11.4	8.3	10.6	20.6
200,000–500,000	5.6	8.9	6.6	8.9	15.5	11.3	7.5	----------	4.4	8.9	14.9	9.3	8.3	----------
100,000–200,000	4.8	7.7	6.1	8.7	9.9	8.9	8.7	----------	3.3	6.5	6.2	5.9	6.6	----------

---

[1] Based on data including deaths of nonwhite residents of cities having small nonwhite populations (less than 20,000 or less than 10 percent according to the 1940 census).

[2] Adjusted for age on the basis of the age distribution of deaths from all causes in 1945 among residents of cities with a population of 100,000 or more in 1940.

[3] Based on data for only those cities in which the nonwhite population constitutes at least 10 percent of the total population or numbers 20,000 or more according to the 1940 census.

NOTE.—The frequencies on which the unadjusted ratios are based are given in appendix table 1.

group within each of the regions have not been computed since the frequencies in each race-sex group become small when further classified by age and the ratios specific for age, race, and sex are subject to considerable error.

In figure 3, marked differences in the relative importance of tuberculosis as a cause of death appear among the four population-size groups. With the exception of cities of a million or greater population, the age-adjusted tuberculosis death ratio decreased with decreasing community-size for each of the four race-sex groups. Among white residents, tuberculosis caused a larger proportion of the total deaths in cities of 500,000 to one million than in cities of one million and over. For the nonwhite population, on the other hand, the reverse was true, and tuberculosis proportionate mortality decreased with successively smaller sizes of the cities. Whether these data indicate a true racial difference in relative mortality from tuberculosis associated with residence in the two largest city-size groups is difficult to determine since the data may also be influenced by differences in the geographic distribution of the white and the nonwhite populations in these two city-size groups.

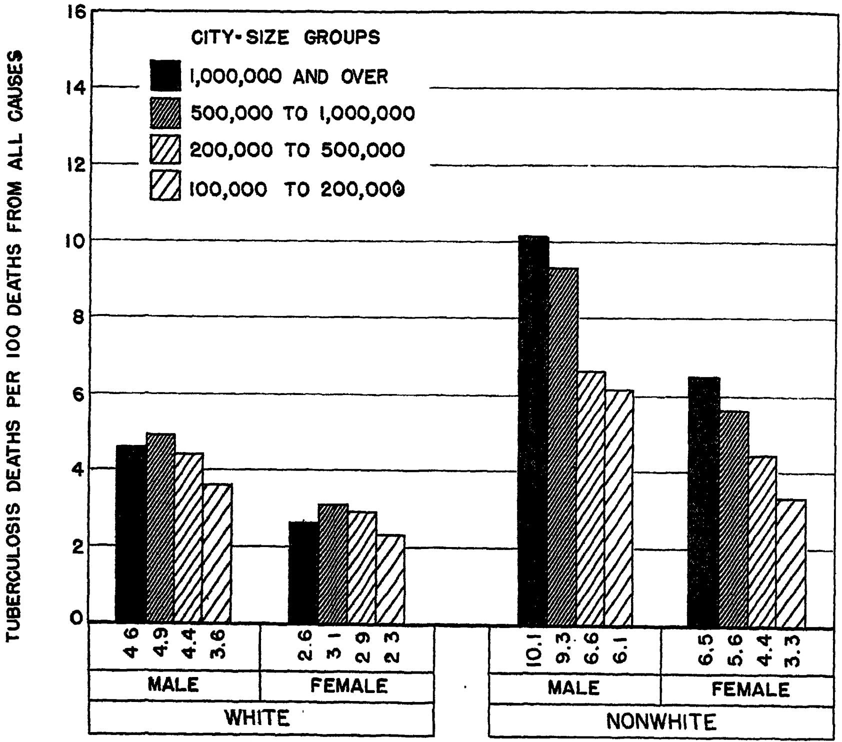


FIGURE 3.—Age-adjusted death ratios for tuberculosis (all forms) by race, sex, and population-size of city, for cities of 100,000 or more: United States, 1945. (By place of residence. Adjusted for age on the basis of the age distribution of deaths from all causes in 1945 among residents of cities with a population of 100,000 or more in 1940.)

When the tuberculosis death ratios are classified by geographic region[9] and adjusted for age, little variation is seen for the white race and the only consistent geographic difference to be discerned is the small advantage of the Middle West, which has the lowest age adjusted ratio for both sexes. (See fig. 4.) Among nonwhites, however, a distinct and consistent pattern can be observed, the ranking of the age adjusted tuberculosis death ratios by area being the same for males and females, with the southern cities apparently having the most favorable mortality experience.

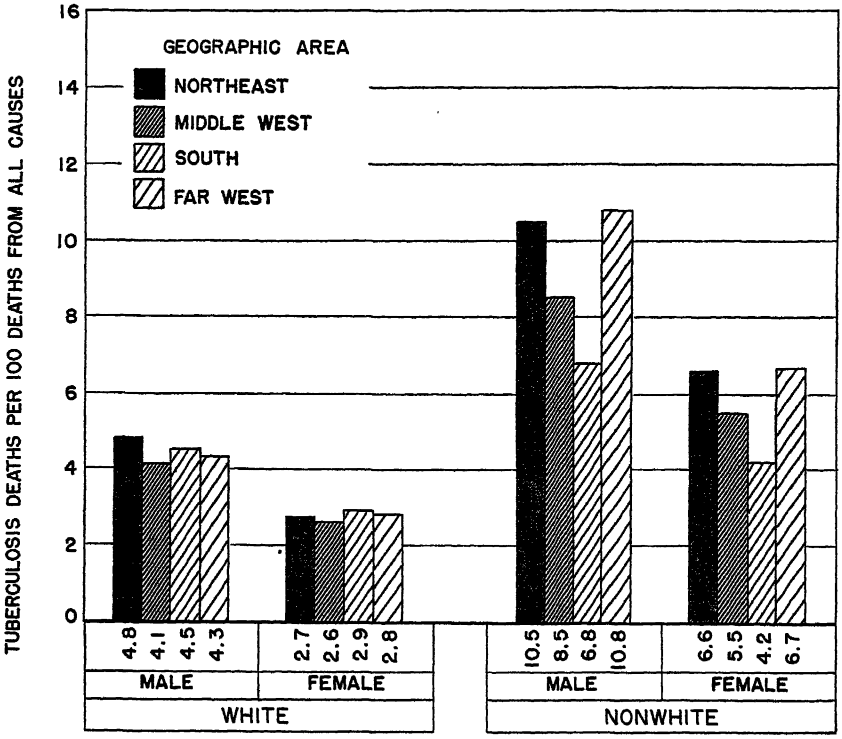


FIGURE 4.—Age-adjusted death ratios for tuberculosis (all forms) by race, sex, and geographic area, for cities of 100,000 or more: United States, 1945. (By place of residence. Adjusted for age on the basis of the age distribution of deaths from all causes in 1945 among residents of cities with a population of 100,000 or more in 1940.)

However, the tuberculosis death ratio for the group of cities in one geographic region may be presumed to be influenced by the distribution of deaths from all causes among the cities of different size in that region. The distribution of total deaths when classified by size of city is different in each of the four areas and varies most markedly for the nonwhite races. (See table 4.) Of the nonwhite deaths recorded for cities of 100,000 or greater population, 81.9 percent in the Northeast and 72.7 percent in the Far West were recorded for residents of cities of one million population and over, while the corresponding proportions for the white race were 57.3 percent and 33.0 percent, respectively. On the other hand, only 1.6 percent of all nonwhite deaths and 18.7 percent of all white deaths in the Northeast were recorded for residents of the smallest cities (100,000 to 200,000 population), while 29.3 percent of the nonwhite deaths and 28.5 percent of the white deaths in the southern cities were among residents of cities of that size.

---

[9] These regions were formed by combination of the nine geographic divisions used by the Bureau of the Census, as follows: Northeast—New England and Middle Atlantic States; South—South Atlantic, East South Central, and West South Central States; Middle West—East North Central and West North Central States; Far West—Mountain and Pacific States.

TABLE 4.—*Percent distribution of deaths from all causes in each area by population-size of city and race for cities of 100,000 or more: United States, 1945*

[By place of residence]

Race and population-size of city	All areas	North-east	Middle West	South	Far West
White [1]	100.0	100.0	100.0	100.0	100.0
1,000,000 and over	40.0	57.3	37.5	----------	33.0
500,00-1,000,000	17.4	13.9	19.4	25.8	15.4
200,000-500,000	24.9	10.1	30.3	45.7	36.1
100,000-200,000	17.7	18.7	12.9	28.5	15.5
Nonwhite [2]	100.0	100.0	100.0	100.0	100.0
1,000,000 and over	36.8	81.9	48.5	----------	72.7
500,000-1,000,000	21.4	10.6	22.7	26.4	27.3
200,000-500,000	27.5	5.9	24.3	44.3	----------
100,000-200,000	14.3	1.6	4.5	29.3	----------

[1] Based on data including deaths of nonwhite residents of cities having small nonwhite populations (less than 20,000 or less than 10 percent according to the 1940 census).

[2] Based on data for only those cities in which the nonwhite population constitutes at least 10 percent of the total population or numbers 20,000 or more according to the 1940 census.

NOTE.—The frequencies on which these proportions are based are given in appendix table 1.

The associations between geographic area and population-size of city, and those which may exist between size of city and tuberculosis mortality, raise the question of the extent to which such factors may be reflected in the geographic variation of the tuberculosis death ratio. It is therefore instructive to compare the tuberculosis death ratios for two or more areas after eliminating variation in the distribution of deaths from all causes by city-size group. Therefore, the unadjusted tuberculosis death ratios for each of the four race-sex groups for each region were adjusted for population-size on the basis of the distribution by population-size of city of deaths from all causes in 1945 in the group of cities having a population of 100,000 to one million.[10] Since there were no cities in the South with a population of one million

---

[10] To illustrate, the adjusted white male death ratio for the northeast cities of 100,000 to 1,000,000 population was computed in the following manner:

$$\text{Adjusted ratio}=\frac{r_1p_1}{100}+\frac{r_2p_2}{100}+\frac{r_3p_3}{100}$$

where r = tuberculosis death ratio for white male residents of cities of one population-size group in the Northeast, not adjusted for age, and

p = percent that deaths from all causes among residents of one city-size group forms of deaths among residents of all cities of 100,000-1,000,000.

The population-size groups 100,000-200,000, 200,000-500,000, and 500,000-1,000,000 are indicated by the subscripts 1, 2, and 3 respectively.

or greater in 1940, cities of this size were excluded from consideration. (Adjusted ratios for nonwhites were not computed for the Far West, since the number of nonwhite deaths in this area for cities under one million was small.) Ratios for cities of 100,000 to 1,000,000 population in each area adjusted for population-size of city are as follows:

	Northeast	*Middle West*	*South*	*Far Wes*
Male, white	4.6	3.5	4.6	4.1
Female, white	2.4	2.2	2.8	2.4
Male, nonwhite	13.4	10.2	9.7	---
Female, nonwhite	11.4	8.0	8.5	---

Comparison of these figures with the unadjusted ratios shown in table 3 indicates the effect of eliminating the largest cities and of holding constant the proportion of deaths in the remaining city-size groups. The greatest change appears for the Middle West. The better relative position of this area for the white population is more clearly seen, the difference between the South and the Middle West becomes small for nonwhite males, and the Middle West ratio for nonwhite females becomes smaller than the ratio for the South.

TABLE 5.—*Death ratios for tuberculosis (all forms) by race, for 92 cities of 100,000 or more: United States, 1945*

[By place of residence. Ratios are the number of deaths from tuberculosis per 100 deaths from all causes]

City	Population-size group (1940 census)	Geographic region	Death ratio		
			All races	White[1]	Non-white[2]
Akron, Ohio	200,000-500,000	Middle West	3.6	3.6	-------
Albany, N. Y	100,000-200,000	Northeast	4.0	4.0	-------
Atlanta, Ga	200,000-500,000	South	4.4	2.6	7.0
Baltimore, Md	500,000-1,000,000	do	6.2	3.7	13.8
Birmingham, Ala	200,000-500,000	do	5.6	2.9	8.5
Boston, Mass	500,000-1,000,000	Northeast	5.1	4.8	11.3
Bridgeport, Conn	100,000-200,000	do	3.7	3.7	-------
Buffalo, N. Y	500,000-1,000,000	do	5.1	5.1	-------
Cambridge, Mass	100,000-200,000	do	2.8	2.8	-------
Camden, N. J	100,000-200,000	do	4.3	3.7	8.2
Canton, Ohio	100,000-200,000	Middle West	1.4	1.4	-------
Charlotte, N. C	100,000-200,000	South	3.6	3.1	4.4
Chattanooga, Tenn	100,000-200,000	do	7.5	5.9	10.2
Chicago, Ill	1,000,000 and over	Middle West	4.7	3.4	13.2
Cincinnati, Ohio	200,000-500,000	do	5.1	3.5	14.5
Cleveland, Ohio	500,000-1,000,000	do	5.0	3.9	12.4
Columbus, Ohio	200,000-500,000	do	4.0	2.8	12.5
Dallas, Tex	200,000-500,000	South	4.3	3.4	7.3
Dayton, Ohio	200,000-500,000	Middle West	3.8	3.3	8.0
Denver, Colo	200,000-500,000	Far West	3.6	3.6	-------
Des Moines, Iowa	100,000-200,000	Middle West	2.0	2.0	-------
Detroit, Mich	1,000,000 and over	do	5.9	4.8	15.6
Duluth, Minn	100,000-200,000	do	1.5	1.5	-------
Elizabeth, N. J	100,000-200,000	Northeast	2.9	2.9	-------
Erie, Pa	100,000-200,000	do	2.4	2.4	-------
Fall River, Mass	100,000-200,000	do	3.2	3.2	-------
Flint, Mich	100,000-200,000	Middle West	3.1	3.1	-------
Fort Wayne, Ind	100,000-200,000	do	3.4	3.4	-------
Fort Worth, Tex	100,000-200,000	South	3.1	2.5	5.8
Gary, Ind	100,000-200,000	Middle West	5.8	3.5	11.3
Grand Rapids, Mich	100,000-200,000	do	1.3	1.3	-------
Hartford, Conn	100,000-200,000	Northeast	4.3	4.3	-------
Houston, Tex	200,000-500,000	South	5.0	4.4	6.6

See footnotes at end of table.

TABLE 5.—*Death ratios for tuberculosis (all forms) by race, for 92 cities of 100,000 or more: United States, 1945*—Continued

City	Population-size group (1940 census)	Geographic region	Death ratio		
			All races	White[1]	Non-white[2]
Indianapolis, Ind.	200,000-500,000	Middle West	3.5	2.7	7.7
Jacksonville, Fla.	100,000-200,000	South	4.9	2.0	8.5
Jersey City, N. J.	200,000-500,000	Northeast	5.2	5.2	--------
Kansas City, Kans.	100,000-200,000	Middle West	2.2	2.0	3.0
Kansas City, Mo.	200,000-500,000	do.	3.5	2.7	8.0
Knoxville, Tenn.	100,000-200,000	South	2.8	2.7	3.4
Long Beach, Calif.	100,000-200,000	Far West	1.7	1.7	--------
Los Angeles, Calif.	1,000,000 and over	do.	4.3	3.8	12.7
Louisville, Ky.	200,000-500,000	South	5.4	3.9	11.2
Lowell, Mass.	100,000-200,000	Northeast	2.4	2.4	--------
Memphis, Tenn.	200,000-500,000	South	4.6	3.2	6.1
Miami, Fla.	100,000-200,000	do.	5.5	3.5	13.2
Milwaukee, Wis.	500,000-1,000,000	Middle West	3.4	3.4	--------
Minneapolis, Minn.	200,000-500,000	do.	2.3	2.3	--------
Nashville, Tenn.	100,000-200,000	South	4.2	3.7	5.1
Newark, N. J.	200,000-500,000	Northeast	4.7	2.8	15.2
New Bedford, Mass.	100,000-200,000	do.	3.6	3.6	--------
New Haven, Conn.	100,000-200,000	do.	2.3	2.3	--------
New Orleans, La.	200,000-500,000	South	6.2	4.8	8.9
New York, N. Y.	1,000,000 and over	Northeast	4.5	3.5	15.2
Norfolk, Va.	100,000-200,000	South	5.4	3.1	8.3
Oakland, Calif.	200,000-500,000	Far West	3.7	3.7	--------
Oklahoma City, Okla.	200,000-500,000	South	3.3	3.3	--------
Omaha, Nebr.	200,000-500,000	Middle West	2.7	2.7	--------
Paterson, N. J.	100,000-200,000	Northeast	2.6	2.6	--------
Peroia, Ill.	100,000-200,000	Middle West	2.3	2.3	--------
Philadelphia, Pa.	1,000,000 and over	Northeast	4.8	3.4	12.0
Pittsburgh, Pa.	500,000-1,000,000	do.	4.3	3.0	13.4
Portland, Oreg.	200,000-500,000	Far West	2.9	2.9	--------
Providence, R. I.	200,000-500,000	Northeast	3.0	3.0	--------
Reading, Pa.	100,000-200,000	do.	3.3	3.3	--------
Richmond, Va.	100,000-200,000	South	4.9	3.1	8.1
Rochester, N. Y.	200,000-500,000	Northeast	3.6	3.6	--------
Sacramento, Calif.	100,000-200,000	Far West	4.9	4.9	--------
St. Louis, Mo.	500,000-1,000,000	Middle West	3.5	2.8	6.7
St. Paul, Minn.	200,000-500,000	do.	2.5	2.5	--------
Salt Lake City, Utah	100,000-200,000	Far West	1.8	1.8	--------
San Antonio, Tex.	200,000-500,000	South	7.9	7.9	--------
San Diego, Calif.	200,000-500,000	Far West	3.4	3.4	--------
San Francisco, Calif.	500,000-1,000,000	do.	4.8	4.2	16.1
Scranton, Pa.	100,000-200,000	Northeast	3.9	3.9	--------
Seattle, Wash.	200,000-500,000	Far West	3.9	3.9	--------
Somerville, Mass.	100,000-200,000	Northeast	2.5	2.5	--------
South Bend, Ind.	100,000-200,000	Middle West	3.2	3.2	--------
Spokane, Wash.	100,000-200,000	Far West	1.8	1.8	--------
Springfield, Mass.	100,000-200,000	Northeast	2.0	2.0	--------
Syracuse, N. Y.	200,000-500,000	do.	2.1	2.1	--------
Tacoma, Wash.	100,000-200,000	Far West	2.5	2.5	--------
Tampa, Fla.	100,000-200,000	South	3.7	2.4	7.2
Toledo, Ohio	200,000-500,000	Middle West	4.8	4.8	--------
Trenton, N. J.	100,000-200,000	Northeast	3.7	3.7	--------
Tulsa, Okla.	100,000-200,000	South	3.7	3.3	6.5
Utica, N. Y.	100,000-200,000	Northeast	3.3	3.3	--------
Washington, D. C.	500,000-1,000,000	South	6.4	3.7	11.1
Wichita, Kans.	100,000-200,000	Middle West	1.6	1.6	--------
Wilmington, Del.	100,000-200,000	South	3.4	2.5	8.2
Worcester, Mass.	100,000-200,000	Northeast	3.2	3.2	--------
Yonkers, N. Y.	100,000-200,000	do.	2.5	2.5	--------
Youngstown, Ohio	100,000-200,000	Middle West	2.1	2.1	--------

---

[1] For cities having small nonwhite populations (less than 20,000 or less than 10 percent of the total population according to the 1940 census) the death ratios for all races are used to approximate those for the white population.

[2] Ratios shown for the nonwhite races are for the cities in which the nonwhite population constitutes at least 10 percent of the total population or numbers 20,000 or more according to the 1940 census.

NOTE.—The numbers of tuberculosis deaths used in computing these death ratios are shown in appendix tables 2-4.

Tuberculosis mortality in each of the 92 cities.—The tuberculosis death ratios[11] for the individual cities of over 100,000 population display inter-city variation in 1945 similar to that for earlier years (table 5). The range of the tuberculosis death ratios for the 92 cities for all races in 1945 was from 1.3 to 7.9 per 100 deaths from all causes, with a median value of 3.6. For the white population alone, the range was the same, but 72 of the 92 cities had ratios between 2.0 and 3.9. The median was 3.2. The ratios for nonwhites in the 40 cities for which data by race were available were widely distributed, varying from 3.0 to 16.1, with a median of 8.5.

The tuberculosis death ratio for the total population of the 92 cities showed a small decrease from 4.5 in 1944 to 4.4 in 1945, and only a few of the changes in the ratios of the individual cities between these two years may be considered statistically significant. Between 1944 and 1945 the tuberculosis death ratios for all races increased by a statistically significant[12] amount in four cities—Fort Wayne, Gary, New Orleans, and Norfolk; for whites[13] in two cities—New Orleans and Norfolk; and for nonwhites, in two cities—Gary and Norfolk. Significant decreases were found in the ratios for Memphis, New Haven, and Peoria for all races; for Birmingham and Tampa for whites[13]; and for Memphis and St. Louis for nonwhites.

With the availability of the data for 1945 the record of the mortality experience for the war period 1942–45 becomes complete. In table 6 are given the tuberculosis death ratios for each of the 92 cities by race for the war period 1942–45, and the immediate prewar period 1939–41, and the corresponding rank numbers. Rank number 1 was assigned to that city in each list which had the lowest death ratio, and the cities were numbered in ascending order of their death ratios to 92 in the arrays for all races and whites, and to 39 in those for nonwhites.

The lowest death ratios in the listings for all races and whites were 1.5 in both periods, while the maximum ratios were 11.0 in 1939–41 and 9.1 in 1942–45. The median value of the death ratios for all races in 1939–41 was 4.2, while the first and third quartile values were 3.2 and 5.5, respectively. The comparable figures in 1942–45 were 3.7, 3.0, and 4.8. These values for the all races lists and the corresponding ones for whites and nonwhites follow on page 20.

---

[11] These death ratios are not shown adjusted for age because it was found that adjustment resulted in very little change as compared with the unadjusted values.

[12] A difference equal to or greater than twice the standard error of the difference was considered statistically significant.

[13] Only the cities for which deaths of whites and nonwhites were tabulated separately were considered.

	All races		White		Nonwhite	
	1942-45	1939-41	1942-45	1939-41	1942-45	1939-41
First quartile	3.0	3.2	2.8	3.0	8.1	9.4
Median	3.7	4.2	3.3	3.5	9.4	11.3
Third quartile	4.8	5.5	3.7	4.2	13.1	13.8

In most cities the death ratios decreased between the two periods or remained the same. The ratios for a few cities, however, showed an increase during the war years over the prewar period, and these were tested for statistical significance. The only increases in the tuberculosis death ratios between 1939–41 and 1942–45 which were at the significant level were for the following cities: for all races—Boston, Buffalo, and Louisville; for whites [13a]—Boston and Louisville; and for nonwhites—Louisville.

TABLE 6.—*Death ratios and rank numbers for tuberculosis (all forms) by race, for 92 cities of 100,000 or more: United States, 1939–41 and 1942–45*

[By place of residence. Ratios are the number of deaths from tuberculosis per 100 deaths from all causes]

City	Ratios						Rank					
	All races		White [1]		Nonwhite [2]		All races		White		Nonwhite	
	1942-45	1939-41	1942-45	1939-41	1942-45	1939-41	1942-45	1939-41	1942-45	1939-41	1942-45	1939-41
Akron, Ohio	3.3	3.0	3.3	3.0	------	------	30	19	41	22	------	------
Albany, N. Y	3.6	3.5	3.6	3.5	------	------	40	28	60	42	------	------
Atlanta, Ga	5.5	6.7	3.0	3.3	8.5	10.0	80	81	31	36	14	14
Baltimore, Md	6.3	6.7	3.9	4.1	13.2	14.2	87	81	78	62	31	31
Birmingham, Ala	6.3	6.8	3.2	3.5	9.3	9.8	87	84	37	42	19	12
Boston, Mass	5.0	4.7	4.6	4.3	13.1	12.9	71	59	83	71	30	25
Bridgeport, Conn	3.6	3.6	3.6	3.6	------	------	40	31	60	49	------	------
Buffalo, N. Y	4.8	4.2	4.8	4.2	------	------	67	44	87	67	------	------
Cambridge, Mass	3.7	3.8	3.7	3.8	------	------	45	33	66	53	------	------
Camden, N. J	4.2	[3] 4.4	3.3	[3] 3.5	9.2	[3] 9.9	56	51	41	42	18	13
Canton, Ohio	2.6	4.1	2.6	4.1	------	------	13	39	16	62	------	------
Charlotte, N. C	3.3	[3] 4.6	2.5	[3] 2.4	4.4	[3] 7.0	30	56	14	9	2	1
Chattanooga, Tenn	7.8	8.9	5.8	6.1	11.0	12.4	91	91	90	90	25	23
Chicago, Ill	4.9	5.7	3.6	4.3	13.6	16.2	70	74	60	71	33	35
Cincinnati, Ohio	5.4	5.1	3.6	3.3	15.3	15.5	78	62	60	36	35	32
Cleveland, Ohio	5.1	5.5	3.8	4.0	14.0	16.6	73	69	73	57	34	36
Columbus, Ohio	4.0	4.3	2.9	3.0	10.6	11.9	52	47	27	22	24	22
Dallas, Tex	4.7	5.6	3.8	4.9	7.6	7.7	64	72	73	83	7	4
Dayton, Ohio [4]	4.6	5.5	4.6	5.5	------	------	59	69	83	88	------	------
Denver, Colo	3.8	4.5	3.8	4.5	------	------	51	54	73	77	------	------
Des Moines, Iowa	1.8	2.2	1.8	2.2	------	------	4	5	4	5	------	------
Detroit, Mich	5.9	6.0	4.3	4.5	16.0	15.9	84	78	82	77	38	34
Duluth, Minn	1.8	2.3	1.8	2.3	------	------	4	8	4	8	------	------
Elizabeth, N. J	2.8	3.9	2.8	3.9	------	------	17	34	22	55	------	------
Erie, Pa	3.0	3.3	3.0	3.3	------	------	23	25	31	36	------	------
Fall River, Mass	3.7	4.1	3.7	4.1	------	------	45	39	66	62	------	------
Flint, Mich	2.7	3.1	2.7	3.1	------	------	16	22	20	28	------	------
Fort Wayne, Ind	3.1	3.7	3.1	3.7	------	------	25	32	33	51	------	------
Fort Worth, Tex	3.6	4.6	3.3	4.0	5.1	7.4	40	56	41	57	3	2
Gary, Ind	5.3	7.2	3.4	5.0	10.1	13.1	77	89	50	84	23	27
Grand Rapids, Mich	1.6	1.5	1.6	1.5	------	------	2	1	2	1	------	------
Hartford, Conn	3.7	3.5	3.7	3.5	------	------	45	28	66	42	------	------
Houston, Tex	5.6	7.0	4.8	6.0	7.7	9.2	81	87	87	89	9	9
Indianapolis, Ind	4.0	4.3	2.9	3.0	9.4	10.7	52	47	27	22	20	18
Jacksonville, Fla	5.7	7.1	2.6	2.8	9.4	11.8	83	88	16	15	20	21
Jersey City, N. J	5.2	5.2	5.2	5.2	------	------	75	65	89	85	------	------
Kansas City, Kans	3.0	4.1	2.8	3.1	4.0	7.4	23	39	22	28	1	2
Kansas City, Mo	3.6	4.3	2.7	3.2	8.4	10.2	40	47	20	30	13	15
Knoxville, Tenn	4.0	5.9	3.5	4.5	6.2	10.5	52	76	55	77	4	17
Long Beach, Calif	1.8	2.2	1.8	2.2	------	------	4	5	4	5	------	------

See footnotes at end of table.

[13a] See footnote 13 on page 19.

TABLE 6.—*Death ratios and rank numbers for tuberculosis (all forms) by race, for 92 cities of 100,000 or more: United States, 1939–41 and 1942–45*—Continued

[By place of residence. Ratios are the number of deaths from tuberculosis per 100 deaths from all causes]

City	Ratios						Rank					
	All races		White[1]		Nonwhite[2]		All races		White		Nonwhite	
	1942–45	1939–41	1942–45	1939–41	1942–45	1939–41	1942–45	1939–41	1942–45	1939–41	1942–45	1939–41
Los Angeles, Calif	4.6	5.0	4.1	4.4	12.6	13.8	59	60	80	73	28	30
Louisville, Ky	5.0	4.0	3.7	2.9	9.7	8.3	71	36	66	19	22	6
Lowell, Mass	2.6	2.8	2.6	2.8	------	------	13	14	16	15	------	------
Memphis, Tenn	5.9	7.9	3.5	4.2	8.3	11.3	84	90	55	67	11	20
Miami, Fla	5.6	5.6	3.3	3.0	13.5	13.0	81	72	41	22	32	26
Milwaukee, Wis	3.7	4.0	3.7	4.0	------	------	45	36	66	57	------	------
Minneapolis, Minn	2.3	2.1	2.3	2.1	------	------	10	4	10	4	------	------
Nashville, Tenn	5.1	5.8	3.8	4.4	7.2	8.0	73	75	73	73	5	5
Newark, N. J	5.2	5.9	3.3	3.8	16.3	18.8	75	76	41	53	39	39
New Bedford, Mass	3.3	4.4	3.3	4.4	------	------	30	51	41	73	------	------
New Haven, Conn	2.9	3.0	2.9	3.0	------	------	21	19	27	22	------	------
New Orleans, La	5.9	6.2	4.2	4.6	8.8	9.0	84	79	81	80	16	8
New York, N. Y	4.6	5.1	3.6	4.0	15.7	17.4	59	62	60	57	36	37
Norfolk, Va	4.8	6.8	2.3	3.5	8.1	11.0	67	84	10	42	10	19
Oakland, Calif	3.4	3.3	3.4	3.3	------	------	36	25	50	36	------	------
Oklahoma City, Okla	3.5	4.2	3.5	4.2	------	------	39	44	55	67	------	------
Omaha, Nebr	2.8	3.2	2.8	3.2	------	------	17	23	22	30	------	------
Paterson, N. J	3.2	2.9	3.2	2.9	------	------	27	17	37	19	------	------
Peoria, Ill	2.8	2.4	2.8	2.4	------	------	17	9	22	9	------	------
Philadelphia, Pa	4.8	5.2	3.3	3.7	12.6	13.7	67	65	41	51	28	29
Pittsburgh, Pa	4.3	4.6	3.1	3.5	12.2	13.2	57	56	33	42	27	28
Portland, Oreg	2.6	2.6	2.6	2.6	------	------	13	11	16	12	------	------
Providence, R. I	3.4	3.4	3.4	3.4	------	------	36	27	50	41	------	------
Reading, Pa	3.4	4.4	3.4	4.4	------	------	36	51	50	73	------	------
Richmond, Va	5.4	5.5	3.4	3.3	8.8	8.5	78	69	50	36	16	7
Rochester, N. Y	3.1	3.0	3.1	3.0	------	------	25	19	33	22	------	------
Sacramento, Calif	6.3	[3] 6.7	6.3	[3] 6.7	------	------	87	81	91	91	------	------
St. Louis, Mo	4.1	4.5	3.1	3.2	8.6	10.2	55	54	33	30	15	15
St. Paul, Minn	2.8	2.8	2.8	2.8	------	------	17	14	22	15	------	------
Salt Lake City, Utah	1.5	2.0	1.5	2.0	------	------	1	2	1	2	------	------
San Antonio, Tex	9.1	11.0	9.1	11.0	------	------	92	92	92	92	------	------
San Diego, Calif	3.7	4.1	3.7	4.1	------	------	45	39	66	62	------	------
San Francisco, Calif	4.6	5.1	4.0	4.6	15.9	17.5	59	62	79	80	37	38
Scranton, Pa	3.6	3.5	3.6	3.5	------	------	40	28	60	42	------	------
Seattle, Wash	3.7	3.9	3.7	3.9	------	------	45	34	66	55	------	------
Somerville, Mass	2.4	2.7	2.4	2.7	------	------	11	13	12	14	------	------
South Bend, Ind	3.2	4.0	3.2	4.0	------	------	27	36	37	57	------	------
Spokane, Wash	1.7	2.0	1.7	2.0	------	------	3	2	3	2	------	------
Springfield, Mass	2.2	2.6	2.2	2.6	------	------	8	11	8	12	------	------
Syracuse, N. Y	2.2	2.9	2.2	2.9	------	------	8	17	8	19	------	------
Tacoma, Wash	2.9	3.2	2.9	3.2	------	------	21	23	27	30	------	------
Tampa, Fla	4.6	5.0	3.5	3.2	7.5	9.4	59	60	55	30	6	10
Toledo, Ohio	4.7	5.4	4.7	5.4	------	------	64	68	85	87	------	------
Trenton, N. J	4.7	5.2	4.7	5.2	------	------	64	65	85	85	------	------
Tulsa, Okla	4.4	6.5	3.8	4.8	8.3	15.5	58	80	73	82	11	32
Utica, N. Y	2.5	2.2	2.5	2.2	------	------	12	5	14	5	------	------
Washington, D. C	6.4	6.9	3.5	3.6	11.5	12.4	90	86	55	49	26	23
Wichita, Kans	2.0	2.5	2.0	2.5	------	------	7	10	7	11	------	------
Wilmington, Del	3.3	4.3	2.4	3.2	7.6	9.4	30	47	12	30	7	10
Worcester, Mass	3.2	2.8	3.2	2.8	------	------	27	14	37	15	------	------
Yonkers, N. Y	3.3	4.1	3.3	4.1	------	------	30	39	41	62	------	------
Youngstown, Ohio	3.3	4.2	3.3	4.2	------	------	30	44	41	67	------	------

---

[1] For cities having small non-white populations (less than 20,000 or less than 10 percent of the total population according to the 1940 census) the death ratios for all races are used to approximate those for the white population.

[2] Ratios shown for the nonwhite races are for the cities in which the nonwhite population constitutes at least 10 percent of the total population or numbers 20,000 or more according to the 1940 census.

[3] Data for 1940–41 only.

[4] The death ratios for Dayton are given for all races only, since data by race were not available for the full period 1939–41. To retain comparability between the two periods, the ratios for 1942–45 are shown only for all races, even though data by race are available for this later period. (See appendix, tables 3 and 4 of this report and corresponding tables in earlier reports of this series.)

Each of these significant increases in the tuberculosis death ratios represents an increase in both the average annual number of tuberculosis deaths and the number of deaths from all causes, and in each case the former figure increased relatively more than the latter. For instance, in Buffalo the average annual number of tuberculosis deaths for 1939–41 was 277, while during the period 1942–45 it was 330, an increase of 53 or 19.1 percent; while the corresponding figures for the deaths from all causes were 6,538 and 6,815, an increase of 4.2 percent. In Buffalo for all races, and in Boston for all races and for whites, the increases in the tuberculosis proportionate mortality were due entirely to changes in the death ratios for the male population, while the tuberculosis death ratios for females stayed almost constant between the two periods. In Louisville the death ratios increased about equally for both sex groups in the white populations, but among nonwhites a greater increase was observed in the tuberculosis death ratios for females between the prewar and war years than in the ratios for males.

Examination of the two rank numbers for each city in each race group shows that the death ratios for most cities kept approximately the same position relative to the entire array of ratios, while rather large changes occurred in the rank order of the death ratios for other cities. It is of interest to note those cities for which there was a change in rank numbers between the two periods equal to one quartile—i. e., 23 places in the lists for all races and whites, and 10 places in the lists for nonwhites. In the list for all races, the rank order of five cities showed shifts of this magnitude between 1939–41 and 1942–45. Three of these changes were downward to relatively more favorable positions in the later period: Canton, 39th in 1939–41 and 13th in 1942–45; Charlotte, 56th position to 30th; and Knoxville, 76th to 52nd. On the other hand, the rank number for two cities was higher in 1942–45 than in 1939–41 by at least 23 places. Buffalo was in 44th place in the prewar list and in 67th in 1942–45, while Louisville was 36th and 71st respectively. These were two of the three cities for which the increases in the death ratios between the two periods were found to be significant.

In the white list the rank numbers of seven cities—Canton, Elizabeth, Gary, New Bedford, Norfolk, Reading, and Youngstown—were lower in 1939–41 than in 1942–45 by at least one quartile; and those for Cincinnati, Hartford, Louisville, and Tampa were higher. In the nonwhite list, changes in the rank order of the death ratios of 10 places or more were found for only 3 cities—decreases for Knoxville and Tulsa, and an increase for Louisville.

APPENDIX TABLE 1.—*Number of deaths from tuberculosis (all forms) and from all causes by race, sex, population-size group, and geographic area, for cities of 100,000 or more: United States, 1945*

[By place of residence. Excludes deaths among armed forces overseas]

Race and population-size of city	Total	Male					Female				
		All areas	North-east	Mid-dle West	South	Far West	All areas	North-east	Mid-dle West	South	Far West
	Deaths from tuberculosis (all forms)										
White,[1] total	13.753	9,631	4,110	2,727	1,372	1,422	4,122	1,632	1,224	647	619
1,000,000 or more	5,621	4.052	2,372	1,195	------	485	1,569	860	480	------	229
500,000-1,000,000	2,655	1,859	687	556	351	265	796	305	238	149	104
200,000-500,000	3,483	2,373	402	752	703	516	1,110	161	381	348	220
100,000-200,000	1,994	1,347	649	224	318	156	647	306	125	150	66
Nonwhite,[2] total	5,710	3,233	1,023	938	1,114	158	2,477	766	744	880	87
1,000,000 or more	2,620	1,471	844	522	------	105	1,149	638	450	------	61
500,000-1,000,000	1,274	764	107	171	433	53	510	67	127	290	26
200,000-500,000	1,250	656	61	216	379	------	594	55	148	391	------
100,000-200,000	566	342	11	29	302	------	224	6	19	199	------
	Deaths from all causes										
White,[1] total	395,727	220,636	89,106	68,895	29,641	32,994	175,091	73,842	53,762	22,915	24,572
1,000,000 or more	158,252	87,767	51,139	26.167	------	10,461	70,485	42,162	19,804	------	8,519
500,000-1,000,000	68,897	38,588	12,532	13,386	7,401	5,269	30,309	10,142	10,389	6,175	3,603
200,000-500,000	98,450	55,297	9,048	20,421	13,716	12,112	43,153	7,488	16,698	10,278	8,689
100,000-200,000	70,128	38,984	16,387	8,921	8,524	5,152	31,144	14,050	6,871	6,462	3,761
Nonwhite,[2] total	51,308	27,277	6,878	7,661	11,669	1,069	24,031	6,055	6,767	10,484	725
1,000,000 or more	18,901	9,972	5,594	3,673	------	705	8,929	4,999	3,331	------	599
500,000-1,000,000	10,980	5,998	780	1,743	3,111	364	4,982	590	1,525	2,741	126
200,000-500,000	14,090	7,398	393	1,920	5,085	------	6,692	369	1,588	4,735	------
100,000-200,000	7,337	3,909	111	325	3,473	------	3,428	97	323	3,008	------

---

[1] Includes deaths of nonwhite residents of cities having small nonwhite populations (less than 20,000 or less than 10 percent according to the 1940 census).

[2] Based on data for only those cities in which the nonwhite population constitutes at least 10 percent of the total population or numbers 20,000 or more according to the 1940 census.

APPENDIX TABLE 2.—*Number of deaths from tuberculosis (all forms), for all races, by sex and age, for 92 cities of 100,000 or more: United States, 1945*

[By place of residence. Excludes deaths among armed forces overseas]

City	Total	Male								Female							
		All ages	Under 15	15 to 24	25 to 34	35 to 44	45 to 64	65 and over	Not stated	All ages	Under 15	15 to 24	25 to 34	35 to 44	45 to 64	65 and over	Not stated
Total	19,463	12,864	372	851	1,677	2,601	5,675	1,685	3	6,599	368	1,495	1,788	1,207	1,212	527	2
Akron, Ohio	84	54	1	1	10	9	25	8	--------	30	3	7	7	8	3	2	--------
Albany, N. Y	68	46	--------	3	5	10	23	5	--------	22	--------	5	6	3	6	2	--------
Atlanta, Ga	174	84	6	11	21	16	20	10	--------	90	7	26	22	19	13	3	--------
Baltimore, Md	682	430	19	46	63	99	165	38	--------	252	20	67	70	49	37	9	--------
Birmingham, Ala	170	87	3	13	22	15	27	7	--------	83	10	29	20	13	7	4	--------
Boston, Mass	500	359	7	8	31	73	185	55	--------	141	1	21	41	26	29	23	--------
Bridgeport, Conn	64	46	1	1	7	8	22	7	--------	18	1	3	3	3	6	2	--------
Buffalo, N. Y	340	224	3	14	30	42	106	29	--------	116	10	25	36	19	17	9	--------
Cambridge, Mass	41	27	--------	1	3	6	16	1	--------	14	--------	2	4	2	4	2	--------
Camden, N. J	62	43	--------	4	5	4	20	10	--------	19	2	4	4	3	2	4	--------
Canton, Ohio	16	8	--------	1	1	--------	5	1	--------	8	1	1	1	1	3	1	--------
Charlotte, N. C	35	26	1	1	3	11	5	5	--------	9	--------	2	4	1	1	1	--------
Chattanooga, Tenn	124	77	1	8	14	20	25	9	--------	47	2	13	15	3	12	2	--------
Chicago, Ill	1,823	1,175	30	97	175	258	514	101	--------	648	40	174	184	116	110	24	--------
Cincinnati, Ohio	330	215	7	19	36	36	96	21	--------	115	7	37	20	25	17	9	--------
Cleveland, Ohio	500	324	3	23	47	55	161	35	--------	176	9	32	47	34	41	13	--------
Columbus, Ohio	165	99	4	9	10	27	39	10	--------	66	1	19	16	10	14	6	--------
Dallas, Tex	133	88	2	8	12	13	38	15	--------	45	4	17	12	3	5	4	--------
Dayton, Ohio	105	62	2	3	8	11	25	13	--------	43	3	11	11	9	5	4	--------
Denver, Colo	148	100	5	6	8	22	41	18	--------	48	2	5	12	12	12	5	--------
Des Moines, Iowa	35	25	--------	1	7	4	10	3	--------	10	--------	5	2	--------	2	1	--------
Detroit, Mich	824	542	13	42	68	123	248	48	--------	282	28	83	81	42	37	11	--------
Duluth, Minn	16	9	1	--------	--------	--------	5	3	--------	7	1	--------	1	1	3	1	--------
Elizabeth, N. J	32	22	--------	2	4	4	12	--------	--------	10	--------	2	2	2	4	--------	--------
Erie, Pa	32	23	1	3	5	4	8	2	--------	9	2	3	2	--------	--------	2	--------
Fall River, Mass	48	29	5	1	2	6	9	6	--------	19	3	4	6	3	3	--------	--------
Flint, Mich	41	26	--------	1	4	2	15	4	--------	15	2	1	5	4	2	1	--------
Fort Wayne, Ind	48	30	2	8	3	3	10	4	--------	18	1	--------	6	1	7	3	--------
Fort Worth, Tex	63	36	3	3	5	9	11	5	--------	27	1	5	5	3	7	6	--------
Gary, Ind	67	47	2	6	6	4	26	2	1	20	3	7	4	3	3	--------	--------

Grand Rapids, Mich	23	13	--------	--------	1		7	2	--------	10	--------	2	3	1	2	2	--------
Hartford, Conn	78	54	2	2	7		28	7	--------	24	3	4	5	6	3	3	--------
Houston, Tex	219	131	5	8	22	[illegible]	47	15	2	88	5	28	23	18	7	6	1
Indianapolis, Ind	187	109	4	4	19	20	48	14	--------	78	1	18	15	18	16	10	--------
Jacksonville, Fla	109	72	2	5	17	22	21	5	--------	37	3	7	15	7	3	2	--------
Jersey City, N. J	175	132	2	6	12	37	56	19	--------	43	2	9	15	11	5	1	--------
Kansas City, Kans	32	19	1	1	4	4	8	1	--------	13	1	3	2	3	4	--------	--------
Kansas City, Mo	183	137	--------	6	15	33	57	26	--------	46	1	9	10	12	10	4	--------
Knoxville, Tenn	35	23	3	1	2	9	4	4	--------	12	1	2	3	--------	3	3	--------
Long Beach, Calif	42	26	1	1	--------	7	11	6	--------	16	--------	2	5	2	4	3	--------
Los Angeles, Calif	880	590	25	46	81	124	230	84	--------	290	19	63	77	53	57	21	--------
Louisville, Ky	237	153	6	10	20	33	68	16	--------	84	6	23	20	13	18	4	--------
Lowell, Mass	31	24	--------	--------	1	4	13	6	--------	7	--------	1	2	1	2	1	--------
Memphis, Tenn	156	84	4	8	11	12	35	14	--------	72	5	22	16	10	10	9	--------
Miami, Fla	109	84	1	3	14	20	39	7	--------	25	--------	2	7	10	4	2	--------
Milwaukee, Wis	216	156	2	4	17	30	74	29	--------	60	7	8	10	18	14	3	--------
Minneapolis, Minn	116	80	1	2	9	7	35	26	--------	36	--------	3	13	7	6	7	--------
Nashville, Tenn	95	64	1	3	15	10	22	13	--------	31	1	3	10	4	7	6	--------
Newark, N. J	235	153	3	11	27	25	74	13	--------	82	8	20	27	9	18	--------	--------
New Bedford, Mass	45	28	1	2	1	6	14	4	--------	17	3	4	5	2	2	1	--------
New Haven, Conn	45	33	3	--------	5	7	13	5	--------	12	1	2	4	1	3	1	--------
New Orleans, La	372	231	6	11	23	50	99	42	--------	141	8	30	49	30	17	7	--------
New York, N. Y	3, 545	2, 475	51	134	299	501	1, 167	323	--------	1, 070	37	208	307	220	205	93	--------
Norfolk, Va	118	72	4	11	8	19	25	5	--------	46	3	15	12	7	6	3	--------
Oakland, Calif	158	110	5	10	10	24	44	17	--------	48	4	13	12	7	9	3	--------
Oklahoma City Okla	64	47	1	3	5	13	18	7	--------	17	--------	7	4	4	2	--------	--------
Omaha, Nebr	70	50	2	4	2	10	22	10	--------	20	--------	5	5	--------	6	4	--------
Paterson, N J	40	34	--------	2	2	6	18	6	--------	6	--------	--------	2	1	2	1	--------
Peoria, Ill	27	17	--------	2	2	2	6	5	--------	10	--------	1	6	1	1	1	--------
Philadelphia, Pa	1, 169	741	23	47	106	118	360	87	--------	428	21	97	117	86	73	34	--------
Pittsburgh, Pa	326	211	9	10	28	45	95	24	--------	115	3	24	35	24	22	7	--------
Portland, Oreg	125	91	7	1	8	15	39	21	--------	34	--------	7	8	9	5	5	--------
Providence, R. I	85	59	--------	3	7	14	26	9	--------	26	2	6	6	3	6	3	--------
Reading, Pa	42	31	--------	--------	--------	4	20	7	--------	11	--------	3	3	3	2	--------	--------
Richmond, Va	126	76	4	5	8	15	38	6	--------	50	5	9	16	9	10	--------	1
Rochester, N. Y	135	91	1	3	7	17	36	27	--------	44	1	5	6	5	11	16	--------
Sacramento, Calif	79	66	--------	4	5	12	36	9	--------	13	--------	4	5	4	--------	--------	--------
St. Louis, Mo	376	247	2	9	22	45	118	51	--------	129	7	23	32	27	28	12	--------
St. Paul, Minn	77	46	1	2	5	7	17	14	--------	31	4	3	10	4	7	3	--------
Salt Lake City, Utah	27	19	--------	1	--------	3	12	3	--------	8	--------	--------	1	3	4	--------	--------

APPENDIX TABLE 2.—*Number of deaths from tuberculosis (all forms), for all races, by sex and age, for 92 cities of 100,000 or more: United States, 1945*—Continued

City	Total	Male								Female							
		All ages	Under 15	15 to 24	25 to 34	35 to 44	45 to 64	65 and over	Not stated	All ages	Under 15	15 to 24	25 to 34	35 to 44	45 to 64	65 and over	Not stated
San Antonio, Texas	296	177	15	37	34	26	52	13	--------	119	9	36	30	16	20	8	--------
San Diego, Calif	94	65	3	5	12	12	21	12	--------	29	2	5	6	3	9	4	--------
San Francisco, Calif	448	318	9	13	32	67	154	43	--------	130	5	24	27	28	32	14	--------
Scranton, Pa	59	41	1	5	6	5	18	6	--------	18	1	6	7	--------	3	1	--------
Seattle, Wash	211	150	5	14	14	33	67	17	--------	61	5	12	12	13	12	7	--------
Somerville, Mass	26	17	--------	--------	--------	4	8	5	--------	9	--------	1	3	3	1	1	--------
South Bend, Ind	33	21	--------	1	2	9	3	6	--------	12	2	2	4	--------	3	1	--------
Spokane, Wash	30	22	1	--------	4	3	8	6	--------	8	1	--------	3	1	1	2	--------
Springfield, Mass	35	17	2	--------	--------	5	9	1	--------	18	1	2	6	2	4	3	--------
Syracuse, N. Y	49	28	1	1	3	4	14	5	--------	21	1	1	6	1	7	5	--------
Tacoma, Wash	44	23	1	6	3	1	9	3	--------	21	1	7	2	6	4	1	--------
Tampa, Fla	52	34	--------	--------	4	7	14	9	--------	18	--------	6	2	6	2	2	--------
Toledo, Ohio	180	116	7	3	14	26	44	22	--------	64	3	13	13	9	20	6	--------
Trenton, N. J	58	34	--------	1	6	5	17	5	--------	24	--------	6	7	5	4	2	--------
Tulsa, Okla	54	32	--------	2	3	8	17	2	--------	22	1	4	7	3	1	6	--------
Utica, N. Y	49	29	1	2	2	6	15	3	--------	20	1	4	4	1	9	1	--------
Washington, D. C	541	354	17	26	57	89	121	44	--------	187	8	48	62	27	29	13	--------
Wichita, Kans	21	17	3	1	2	2	6	3	--------	4	--------	--------	--------	1	2	1	--------
Wilmington, Del	49	24	--------	2	5	5	11	1	--------	25	--------	5	6	3	5	6	--------
Worcester, Mass	83	60	1	2	5	10	35	7	--------	23	--------	3	5	4	8	3	--------
Yonkers, N. Y	34	22	--------	--------	3	5	10	4	--------	12	--------	2	2	1	6	1	--------
Youngstown, Ohio	38	21	--------	1	4	2	10	4	--------	17	1	3	2	3	4	4	--------

APPENDIX TABLE 3.—*Number of deaths from tuberculosis (all forms), for the white race, by sex and age, for 92 cities*[1] *of 100,000 or more: United States, 1945*

[By place of residence. Excludes deaths of armed forces overseas]

City	Total	Male								Female							
		All ages	Under 15	15 to 24	25 to 34	35 to 44	45 to 64	65 and over	Not stated	All ages	Under 15	15 to 24	25 to 34	35 to 44	45 to 64	65 and over	Not stated
Total	13,753	9,631	232	412	1,027	1,823	4,634	1,500	3	4,122	194	700	1,046	782	927	473	-------
Akron, Ohio	84	54	1	1	10	9	25	8	-------	30	3	7	7	8	3	2	-------
Albany, N. Y	68	46	-------	3	5	10	23	5	-------	22	-------	5	6	3	6	2	-------
Atlanta, Ga	58	32	-------	-------	8	4	12	8	-------	26	1	7	6	3	7	2	-------
Baltimore, Md	305	214	4	7	26	50	97	30	-------	91	1	18	25	19	21	7	-------
Birmingham, Ala	45	28	-------	1	4	5	13	5	-------	17	3	3	1	3	3	4	-------
Boston, Mass	450	329	6	5	26	67	175	50	-------	121	-------	16	34	23	26	22	-------
Bridgeport, Conn	64	46	1	1	7	8	22	7	-------	18	1	3	3	3	6	2	-------
Buffalo, N. Y	340	224	3	14	30	42	106	29	-------	116	10	25	36	19	17	9	-------
Cambridge, Mass	41	27	-------	1	3	6	16	1	-------	14	-------	2	4	2	4	2	-------
Camden, N. J	45	32	-------	1	3	3	15	10	-------	13	2	-------	3	2	2	4	-------
Canton, Ohio	16	8	-------	1	1	-------	5	1	-------	8	1	1	1	1	3	1	-------
Charlotte, N. C	18	13	-------	-------	1	4	4	4	-------	5	-------	1	1	1	1	1	-------
Chattanooga, Tenn	63	44	1	3	7	10	16	7	-------	19	1	2	3	1	11	1	-------
Chicago, Ill	1,161	821	12	44	99	168	411	87	-------	340	14	63	103	60	79	21	-------
Cincinnati, Ohio	189	131	3	3	19	24	68	14	-------	58	4	9	13	10	14	8	-------
Cleveland, Ohio	330	225	1	5	31	35	121	32	-------	105	6	13	25	20	28	13	-------
Columbus, Ohio	100	60	4	5	4	15	27	5	-------	40	-------	7	8	7	12	6	-------
Dallas, Tex	78	60	1	4	4	10	27	14	-------	18	1	7	3	1	2	4	-------
Dayton, Ohio	80	47	-------	1	6	6	22	12	-------	33	1	9	9	8	2	4	-------
Denver, Colo	148	100	5	6	8	22	41	18	-------	48	2	5	12	12	12	5	-------
Des Moines, Iowa	35	25	-------	1	7	4	10	3	-------	10	-------	5	2	-------	2	1	-------
Detroit, Mich	514	374	7	13	42	73	197	42	-------	140	11	30	45	23	23	8	-------
Duluth, Minn	16	9	1	-------	-------	-------	5	3	-------	7	1	-------	1	1	3	1	-------
Elizabeth, N. J	32	22	-------	2	4	4	12	-------	-------	10	-------	2	2	2	4	-------	-------
Erie, Pa	32	23	1	3	5	4	8	2	-------	9	2	3	2	-------	-------	2	-------
Fall River, Mass	48	29	5	1	2	6	9	6	-------	19	3	4	6	3	3	-------	-------
Flint, Mich	41	26	-------	1	4	2	15	4	-------	15	2	1	5	4	2	1	-------
Fort Wayne, Ind	48	30	2	8	3	3	10	4	-------	18	1	-------	6	1	7	3	-------
Fort Worth, Tex	41	24	1	-------	4	7	9	3	-------	17	1	-------	2	2	6	6	-------
Gary, Ind	28	23	1	-------	1	1	17	2	1	5	-------	2	1	1	1	-------	-------

See footnote at end of table.

APPENDIX TABLE 3.—*Number of deaths from tuberculosis (all forms), for the white race, by sex and age, for 92 cities*[1] *of 100,000 or more: United States, 1945*—Continued

City	Total	Male								Female							
		All ages	Under 15	15 to 24	25 to 34	35 to 44	45 to 64	65 and over	Not stated	All ages	Under 15	15 to 24	25 to 34	35 to 44	45 to 64	65 and over	Not stated
Grand Rapids, Mich	23	13	--------	--------	1	3	7	2	--------	10	--------	2	3	1	2	2	--------
Hartford, Conn	78	54	2	2	7	8	28	7	--------	24	3	4	5	6	3	3	--------
Houston, Tex	138	95	1	5	12	21	41	13	2	43	4	15	7	7	5	5	--------
Indianapolis, Ind	120	72	2	3	11	12	34	10	--------	48	1	8	9	9	12	9	--------
Jacksonville, Fla	25	22	2	--------	5	7	4	4	--------	3	--------	--------	1	--------	1	1	--------
Jersey City, N. J	175	132	2	6	12	37	56	19	--------	43	2	9	15	11	5	1	--------
Kansas City, Kans	23	14	1	--------	3	3	6	1	--------	9	--------	2	1	3	3	--------	--------
Kansas City, Mo	117	96	--------	1	6	20	46	23	--------	21	--------	1	4	6	6	4	--------
Knoxville, Tenn	26	16	3	1	2	4	2	4	--------	10	--------	2	2	--------	3	3	--------
Long Beach, Calif	42	26	1	1	--------	7	11	6	--------	16	--------	2	5	2	4	3	--------
Los Angeles, Calif	714	485	21	29	59	100	200	76	--------	229	17	40	60	45	50	17	--------
Louisville, Ky	131	86	4	1	11	20	37	13	--------	45	5	8	9	7	12	4	--------
Lowell, Mass	31	24	--------	--------	1	4	13	6	--------	7	--------	1	2	1	2	1	--------
Memphis, Tenn	55	36	2	1	4	5	15	9	--------	19	--------	--------	5	2	5	7	--------
Miami, Fla	54	44	--------	2	4	6	28	4	--------	10	--------	--------	2	3	3	2	--------
Milwaukee, Wis	216	156	2	4	17	30	74	29	--------	60	7	8	10	18	14	3	--------
Minneapolis, Minn	116	80	1	2	9	7	35	26	--------	36	--------	3	13	7	6	7	--------
Nashville, Tenn	56	39	1	3	5	5	15	10	--------	17	--------	1	3	3	5	5	--------
Newark, N. J	119	92	1	3	10	15	51	12	--------	27	--------	4	8	4	11	--------	--------
New Bedford, Mass	45	28	1	2	1	6	14	4	--------	17	3	4	5	2	2	1	--------
New Haven, Conn	45	33	3	--------	5	7	13	5	--------	12	1	2	4	1	3	1	--------
New Orleans, La	186	142	3	1	14	19	73	32	--------	44	1	4	14	11	9	5	--------
New York, N. Y	2,546	1,888	35	59	168	360	976	290	--------	658	21	82	169	156	149	81	--------
Norfolk, Va	38	23	2	4	1	4	10	2	--------	15	1	4	3	2	2	3	--------
Oakland, Calif	158	110	5	10	10	24	44	17	--------	48	4	13	12	7	9	3	--------
Oklahoma City, Okla	64	47	1	3	5	13	18	7	--------	17	--------	7	4	4	2	--------	--------
Omaha, Nebr	70	50	2	4	2	10	22	10	--------	20	--------	5	5	--------	6	4	--------
Paterson, N. J	40	34	--------	2	2	6	18	6	--------	6	--------	--------	2	1	2	1	--------
Peoria, Ill	27	17	--------	2	2	2	6	5	--------	10	--------	1	6	1	1	1	--------
Philadelphia, Pa	686	484	11	14	51	66	267	75	--------	202	5	33	51	43	44	26	--------
Pittsburgh, Pa	202	134	3	4	10	28	69	20	--------	68	1	11	21	15	14	6	--------
Portland, Oreg	125	91	7	1	8	15	39	21	--------	34	--------	7	8	9	5	5	--------
Providence, R. I	85	59	--------	3	7	14	26	9	--------	26	2	6	6	3	6	3	--------
Reading, Pa	42	31	--------	--------	--------	4	20	7	--------	11	--------	3	3	3	2	--------	--------
Richmond, Va	50	33	--------	--------	2	7	19	5	--------	17	1	2	4	4	6	--------	--------

Rochester, N. Y.	135	91	1	3	7	17	36	27	------	44	1	5	6	5	11	16	------
Sacramento, Calif.	79	66	------	4	5	12	36	9	------	13	------	4	5	4	------	------	------
St. Louis, Mo.	248	175	------	5	12	24	89	45	------	73	3	13	17	13	17	10	------
St. Paul, Minn.	77	46	1	2	5	7	17	14	------	31	4	3	10	4	7	3	------
Salt Lake City, Utah	27	19	------	1	------	3	12	3	------	8	------	------	1	3	4	------	------
San Antonio, Tex.	296	177	15	37	34	26	52	13	------	119	9	36	30	16	20	8	------
San Diego, Calif.	94	65	3	5	12	12	21	12	------	29	2	5	6	3	9	4	------
San Francisco, Calif.	369	265	8	5	25	54	135	38	------	104	5	13	19	24	30	13	------
Scranton, Pa.	59	41	1	5	6	5	18	6	------	18	1	6	7	------	3	1	------
Seattle, Wash.	211	150	5	14	14	33	67	17	------	61	5	12	12	13	12	7	------
Somerville, Mass.	26	17	------	------	------	4	8	5	------	9	------	1	3	3	1	1	------
South Bend, Ind.	33	21	------	1	2	9	3	6	------	12	2	2	4	------	3	1	------
Spokane, Wash.	30	22	1	------	4	3	8	6	------	8	1	------	3	1	1	2	------
Springfield, Mass.	35	17	2	------	------	5	9	1	------	18	1	2	6	2	4	3	------
Syracuse, N. Y.	49	28	1	1	3	4	14	5	------	21	1	1	6	1	7	5	------
Tacoma, Wash.	44	23	1	6	3	1	9	3	------	21	1	7	2	6	4	1	------
Tampa, Fla.	25	19	------	------	2	8	7	7	------	6	------	2	1	1	1	1	------
Toledo, Ohio	180	116	7	8	14	26	44	22	------	64	3	13	13	9	20	6	------
Trenton, N. J.	58	34	------	1	6	5	17	5	------	24	------	6	7	5	4	2	------
Tulsa, Okla.	42	25	------	------	2	6	15	2	------	17	1	2	4	3	1	6	------
Utica, N. Y.	49	29	1	2	2	6	15	3	------	20	1	4	4	1	9	1	------
Washington, D. C.	195	137	2	3	11	35	59	27	------	58	1	9	12	14	13	9	------
Wichita, Kans.	21	17	3	1	2	2	6	3	------	4	------	------	------	1	2	1	------
Wilmington, Del.	30	16	------	2	3	3	7	1	------	14	------	2	3	2	2	5	------
Worcester, Mass.	83	60	1	2	5	10	35	7	------	23	------	3	5	4	8	3	------
Yonkers, N. Y.	34	22	------	------	3	5	10	4	------	12	------	2	2	1	6	1	------
Youngstown, Ohio	38	21	------	1	4	2	10	4	------	17	1	3	2	3	4	4	------

---

[1] Deaths of nonwhites are included with those for whites for cities having small nonwhite populations (less than 20,000 or less than 10 percent of the total population according to the 1940 census).

APPENDIX TABLE 4.—*Number of deaths from tuberculosis (all forms), for the nonwhite races, by sex and age, for 40 cities*[1] *of 100,000 or more: United States, 1945*

[By place of residence. Excludes deaths among armed forces overseas]

City	Total	Male								Female							
		All ages	Under 15	15 to 24	25 to 34	35 to 44	45 to 64	65 and over	Not stated	All ages	Under 15	15 to 24	25 to 34	35 to 44	45 to 64	65 and over	Not stated
Total	5,710	3,233	140	439	650	778	1,041	185	--------	2,477	174	795	742	425	285	54	2
Atlanta, Ga	116	52	6	11	13	12	8	2	--------	64	6	19	16	16	6	1	--------
Baltimore, Md	377	216	15	39	37	49	68	8	--------	161	19	49	45	30	16	2	--------
Birmingham, Ala	125	59	3	12	18	10	14	2	--------	66	7	26	19	10	4	--------	--------
Boston, Mass	50	30	1	3	5	6	10	5	--------	20	1	5	7	3	3	1	--------
Camden, N. J	17	11	--------	3	2	1	5	--------	--------	6	--------	4	1	1	--------	--------	--------
Charlotte, N. C	17	13	1	1	2	7	1	1	--------	4	--------	1	3	--------	--------	--------	--------
Chattanooga, Tenn	61	33	--------	5	7	10	9	2	--------	28	1	11	12	2	1	1	--------
Chicago, Ill	662	354	18	53	76	90	103	14	--------	308	26	111	81	56	31	3	--------
Cincinnati, Ohio	141	84	4	16	17	12	28	7	--------	57	3	28	7	15	3	1	--------
Cleveland, Ohio	170	99	2	18	16	20	40	3	--------	71	3	19	22	14	13	--------	--------
Columbus, Ohio	65	39	--------	4	6	12	12	5	--------	26	1	12	8	3	2	--------	--------
Dallas, Tex	55	28	1	4	8	3	11	1	--------	27	3	10	9	2	3	--------	--------
Dayton, Ohio	25	15	2	2	2	5	3	1	--------	10	2	2	2	1	3	--------	--------
Detroit, Mich	310	168	6	29	26	50	51	6	--------	142	17	53	36	19	14	3	--------
Fort Worth, Tex	22	12	2	3	1	2	2	2	--------	10	--------	5	3	1	1	--------	--------
Gary, Ind	39	24	1	6	5	3	9	--------	--------	15	3	5	3	2	2	--------	--------
Houston, Tex	81	36	4	3	10	11	6	2	--------	45	1	13	16	11	2	1	1
Indianapolis, Ind	67	37	2	1	8	8	14	4	--------	30	--------	10	6	9	4	1	--------
Jacksonville, Fla	84	50	--------	5	12	15	17	1	--------	34	3	7	14	7	2	1	--------
Kansas City, Kans	9	5	--------	1	1	1	2	--------	--------	4	1	1	1	--------	1	--------	--------
Kansas City, Mo	66	41	--------	5	9	13	11	3	--------	25	1	8	6	6	4	--------	--------
Knoxville, Tenn	9	7	--------	--------	--------	5	2	--------	--------	2	1	--------	1	--------	--------	--------	--------
Los Angeles, Calif	166	105	4	17	22	24	30	8	--------	61	2	23	17	8	7	4	--------
Louisville, Ky	106	67	2	9	9	13	31	3	--------	39	1	15	11	6	6	--------	--------
Memphis, Tenn	101	48	2	7	7	7	20	5	--------	53	5	22	11	8	5	2	--------
Miami, Fla	55	40	1	1	10	14	11	3	--------	15	--------	2	5	7	1	--------	--------
Nashville, Tenn	39	25	--------	--------	10	5	7	3	--------	14	1	2	7	1	2	1	--------
Newark, N. J	116	61	2	8	17	10	23	1	--------	55	8	16	19	5	7	--------	--------
New Orleans, La	186	89	3	10	9	31	26	10	--------	97	7	26	35	19	8	2	--------
New York, N. Y	999	587	16	75	131	141	191	33	--------	412	16	126	138	64	56	12	--------
Norfolk, Va	80	49	2	7	7	15	15	3	--------	31	2	11	9	5	4	--------	--------
Philadelphia, Pa	483	257	12	33	55	52	93	12	--------	226	16	64	66	43	29	8	--------
Pittsburgh, Pa	124	77	6	6	18	17	26	4	--------	47	2	13	14	9	8	1	--------
Richmond, Va	76	43	4	5	6	8	19	1	--------	33	4	7	12	5	4	--------	1
St. Louis, Mo	128	72	2	4	10	21	29	6	--------	56	4	10	15	14	11	2	--------
San Francisco, Calif	79	53	1	8	7	13	19	5	--------	26	--------	11	8	4	2	1	--------
Tampa, Fla	27	15	--------	--------	2	4	7	2	--------	12	--------	4	1	5	1	1	--------
Tulsa, Okla	12	7	--------	2	1	2	2	--------	--------	5	--------	2	3	--------	--------	--------	--------
Washington, D. C	346	217	15	23	46	54	62	17	--------	129	7	39	50	13	16	4	--------
Wilmington, Del	19	8	--------	--------	2	2	4	--------	--------	11	--------	3	3	1	3	1	--------

---

[1] Cities shown in this table are those in which the nonwhite population constitutes at least 10 percent of the total population or numbers 20,000 or more according to the 1940 census.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED DECEMBER 13, 1947

Summary

A total of 3,973 cases of influenza was reported, as compared with 3,008 last week and a 5-year (1942–46) median of 2,924. The increase is accounted for chiefly in the reports from Virginia (379 to 721), South Carolina (476 to 542), West Virginia (32 to 79), Arkansas (63 to 89), Louisiana (29 to 301), Texas (1,512 to 1,639), and California (11 to 99). No other State reported more than 81 cases or showed an increase of more than 25. The total to date since July 26 (approximate average date of seasonal low incidence) is 29,177 cases, as compared with 26,977 for the corresponding period last year (which number is also the 5-year median for the period.

A total of 107 cases of poliomyelitis was reported for the current week as compared with 132 last week, 197 and 115, respectively, for the corresponding weeks of 1946 and 1945, and a 5-year median of 89. States reporting the largest numbers currently are Ohio 13 (last week 17), Idaho 11 (last week 19), and New York, Michigan, and California 9 cases each. The total since March 15, the average date of seasonal low incidence, 10,072, as compared with 24,489 for the same period last year and a 5-year median of 13,161, is less than reported for the corresponding period of any other year since 1942 (3,841).

Three cases of smallpox were reported currently (2 in Ohio and 1 in South Dakota), and 2 cases of Rocky Mountain spotted fever (1 each in New Jersey and North Carolina). The total of 79 cases of typhoid and paratyphoid fever for the week (last week 50, 5-year median 56) includes 30 cases of paratyphoid and 1 case of typhoid fever in Oklahoma. Included in the current total of 115 cases of undulant fever (last week 95, same week last year 123), are 21 cases in Michigan, 17 in Wisconsin, and 8 each in Illinois, Iowa, and Nebraska.

Deaths recorded during the week in 93 large cities of the United States totaled 9,942, as compared with 10,096 last week, 9,612 and 10,228, respectively, for the corresponding weeks of 1946 and 1945, and a 3-year (1944–46) median of 9,612. The cumulative figure is 459,534, as compared with 451,426 for the same period last year. Infant deaths during the week in the same cities totaled 697, as compared with 724 last week and a 3-year median of 640. The cumulative number is 36,592, as compared with 33,425 for the same period last year.

769681—48——3

Telegraphic morbidity reports from State health officers for the week ended Dec. 13, 1947, and comparison with corresponding week of 1946 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46
	Dec. 13, 1947	Dec. 14, 1946		Dec. 13, 1947	Dec. 14, 1946		Dec. 13, 1947	Dec. 14, 1946		Dec. 13, 1947	Dec. 14, 1946	
NEW ENGLAND												
Maine	1	5	3	-------	3	3	5	268	13	0	0	1
New Hampshire	0	0	0	1	1	1	-------	55	13	0	0	0
Vermont	1	0	0	-------	-------	-------	2	148	5	0	0	0
Massachusetts	4	25	5	-------	-------	-------	72	239	239	1	3	6
Rhode Island	1	0	1	-------	-------	8	-------	13	4	1	0	1
Connecticut	0	0	0	1	2	3	3	54	14	3	2	2
MIDDLE ATLANTIC												
New York	14	26	21	[1]9	[1]4	[1]12	224	179	266	2	8	17
New Jersey	9	7	4	4	5	9	239	109	40	1	3	6
Pennsylvania	13	17	11	(2)	[2]7	[2]7	158	551	506	6	0	7
EAST NORTH CENTRAL												
Ohio	19	25	15	3	8	10	161	128	52	3	2	4
Indiana	16	23	7	1	4	15	52	11	11	1	3	2
Illinois	1	19	8	3	4	10	563	11	83	1	2	7
Michigan [3]	9	7	7	-------	2	6	472	77	77	0	2	3
Wisconsin	2	9	2	6	22	49	98	28	28	1	0	3
WEST NORTH CENTRAL												
Minnesota	8	10	9	1	-------	1	310	4	6	1	3	2
Iowa	2	1	3	-------	2	2	94	7	13	0	2	0
Missouri	6	12	5	11	2	4	7	-------	8	1	1	3
North Dakota	2	5	2	2	14	14	77	-------	-------	1	1	0
South Dakota	0	3	2	-------	-------	-------	9	3	3	0	0	0
Nebraska	0	2	2	11	-------	31	16	3	12	0	2	1
Kansas	9	9	9	1	3	4	7	4	19	0	1	1
SOUTH ATLANTIC												
Delaware	0	1	0	-------	-------	-------	1	1	1	0	1	1
Maryland [3]	17	7	7	4	3	5	1	19	11	0	0	6
District of Columbia	0	0	0	1	-------	3	12	14	3	0	0	0
Virginia	6	9	9	721	255	255	28	34	34	3	3	4
West Virginia	7	4	4	79	49	49	187	12	12	1	0	1
North Carolina	29	9	14	-------	-------	-------	4	133	20	5	2	2
South Carolina	13	11	7	542	498	498	4	60	13	0	0	1
Georgia	16	5	13	17	19	59	24	27	21	2	2	1
Florida	13	15	8	19	20	8	6	22	4	0	0	0
EAST SOUTH CENTRAL												
Kentucky	6	24	11	1	-------	5	5	1	10	0	2	2
Tennessee	17	5	10	49	27	40	8	6	12	1	1	1
Alabama	13	19	17	58	44	53	16	34	2	3	1	1
Mississippi [3]	3	5	12	19	-------	-------	15	-------	-------	1	2	2
WEST SOUTH CENTRAL												
Arkansas	3	9	9	89	79	90	22	9	14	0	0	2
Louisiana	5	8	9	301	2	3	9	-------	5	0	1	1
Oklahoma	13	8	9	117	103	137	2	2	6	5	2	1
Texas	25	16	49	1,639	1,365	1,702	148	58	51	4	6	4
MOUNTAIN												
Montana	1	1	1	4	20	20	114	70	70	0	0	0
Idaho	0	0	0	18	8	4	3	2	3	0	1	0
Wyoming	0	0	0	-------	-------	66	20	1	8	0	0	0
Colorado	5	8	7	22	26	54	34	7	12	1	1	1
New Mexico	5	1	2	-------	4	4	6	32	1	0	0	1
Arizona	3	5	2	81	254	254	3	30	7	0	1	1
Utah [3]	5	0	0	5	2	8	16	7	9	0	0	0
Nevada	0	0	0	-------	-------	-------	-------	-------	1	0	0	0
PACIFIC												
Washington	4	3	7	-------	-------	-------	31	23	52	0	0	3
Oregon	2	0	3	34	1	21	25	23	26	1	0	1
California	10	18	23	99	13	25	310	73	126	4	9	9
Total	338	396	396	3,973	2,875	2,924	3,623	2,592	2,592	54	70	108
50 weeks	11,977	15,574	14,995	330,690	217,174	217,174	207,363	658,025	587,903	3,307	5,535	7,710
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	5,680	6,946	7,718	29,177	26,977	26,977	21,861	17,940	21,111	666	869	1,215

[1] New York City only.

[2] Philadelphia only.

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended Dec. 13, 1947, and comparison with corresponding week of 1946 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1942-46	Week ended—		Median 1942-46	Week ended—		Median 1942-46	Week ended—		Median 1942-46
	Dec. 13, 1947	Dec. 14, 1946		Dec. 13, 1947	Dec. 14, 1946		Dec. 13, 1947	Dec. 14, 1946		Dec. 13, 1947 [5]	Dec. 14, 1946	
NEW ENGLAND												
Maine	0	0	0	27	37	25	0	0	0	0	3	1
New Hampshire	0	1	0	13	5	5	0	0	0	0	0	0
Vermont	0	3	1	4	3	3	0	0	0	0	0	0
Massachusetts	1	8	2	108	176	193	0	0	0	4	2	2
Rhode Island	0	1	0	8	11	11	0	0	0	0	0	0
Connecticut	0	1	1	26	28	40	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	9	14	14	178	306	301	0	0	0	3	2	4
New Jersey	0	4	1	55	70	70	0	0	0	2	0	1
Pennsylvania	2	3	1	170	169	174	0	0	0	3	5	4
EAST NORTH CENTRAL												
Ohio	13	10	2	226	257	269	2	1	0	1	2	2
Indiana	3	6	0	69	58	54	0	0	0	0	2	0
Illinois	5	18	2	100	118	150	0	0	0	2	1	2
Michigan [3]	9	6	3	100	161	161	0	0	0	3	0	3
Wisconsin	4	8	2	46	56	128	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	2	4	1	72	37	60	0	0	0	2	0	0
Iowa	1	5	1	58	18	45	0	0	0	0	0	0
Missouri	2	4	2	19	33	52	0	1	0	1	0	1
North Dakota	0	10	0	5	11	13	0	0	0	0	3	0
South Dakota	0	5	1	2	4	16	1	0	0	0	2	0
Nebraska	0	6	1	24	19	22	0	0	0	1	0	0
Kansas	0	2	2	19	28	78	0	0	1	0	0	0
SOUTH ATLANTIC												
Delaware	1	0	0	6	7	5	0	0	0	1	1	0
Maryland [3]	0	2	1	19	35	43	0	0	0	1	2	1
District of Columbia	0	0	0	3	10	14	0	0	0	0	0	1
Virginia	0	1	1	36	42	42	0	0	0	0	2	0
West Virginia	1	0	0	36	23	42	0	0	0	1	0	0
North Carolina	7	1	1	38	33	63	0	0	0	0	1	0
South Carolina	0	0	0	11	9	9	0	0	0	0	0	0
Georgia	3	0	0	32	18	29	0	0	0	1	0	1
Florida	6	4	3	11	10	8	0	0	0	2	0	1
EAST SOUTH CENTRAL												
Kentucky	1	0	2	33	43	52	0	0	0	0	2	2
Tennessee	2	5	0	53	21	37	0	0	0	1	1	1
Alabama	0	2	0	8	8	20	0	0	0	0	2	1
Mississippi [3]	0	5	1	4	6	8	0	0	0	0	1	1
WEST SOUTH CENTRAL												
Arkansas	2	3	1	5	5	11	0	0	0	0	2	2
Louisiana	0	3	1	7	6	8	0	0	0	7	0	3
Oklahoma	0	2	0	12	11	18	0	1	0	31	0	1
Texas	5	14	4	29	33	55	0	0	0	4	2	6
MOUNTAIN												
Montana	0	0	0	24	8	12	0	0	0	0	3	0
Idaho	11	1	0	4	8	13	0	0	0	0	2	1
Wyoming	0	0	0	4	2	7	0	0	0	0	0	0
Colorado	0	1	0	36	33	35	0	0	0	0	0	0
New Mexico	0	2	0	20	14	14	0	0	0	1	0	1
Arizona	0	2	1	8	16	14	0	0	0	0	1	1
Utah [3]	2	0	0	21	31	32	0	0	0	0	0	0
Nevada	1	0	0	1	0	0	0	0	0	0	0	0
PACIFIC												
Washington	4	9	4	51	57	57	0	0	0	2	1	1
Oregon	2	0	0	0	30	34	0	0	0	2	1	0
California	9	21	15	93	143	171	0	0	0	3	3	3
Total	108	197	89	1,934	2,267	2,882	3	3	6	79	49	56
50 weeks	10,684	24,960	13,558	79,935	109,152	134,742	163	330	377	3,802	3,925	5,302
Seasonal low week [4]	(11th) Mar. 15-21			(32nd) Aug. 9-15			(35th) Aug. 30-Sept. 5			(11th) Mar. 15-21		
Total since low	10,072	24,493	13,161	17,832	22,857	33,963	16	51	70	3,317	3,450	4,486

---

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately, as follows: Massachusetts 3 (salmonella infection); New Jersey 1; Ohio 1; Florida 1; Oklahoma 30; California 1.

Telegraphic morbidity reports from State health officers for the week ended Dec. 13, 1947, and comparison with corresponding week of 1946 and 5-year median—Con.

Division and State	Whooping cough			Week ended December 13, 1947							
	Week ended—		Median 1942–46	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Dec. 13, 1947	Dec. 14, 1946		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	23	18	33		2						2
New Hampshire		25	11								
Vermont	42	12	20								3
Massachusetts	155	170	164		6						
Rhode Island	23	16	17								1
Connecticut	127	48	58								1
MIDDLE ATLANTIC											
New York	217	290	286	18	6		1		1		5
New Jersey	143	183	152	1				1	1		2
Pennsylvania	211	274	129				1				2
EAST NORTH CENTRAL											
Ohio	169	112	112								1
Indiana	61	16	15			1				1	3
Illinois	100	114	76	9	10		1		3		8
Michigan [3]	162	208	208	1	2				1		21
Wisconsin	196	273	177								17
WEST NORTH CENTRAL											
Minnesota	87	16	20				3				2
Iowa	24	18	19	1							8
Missouri	31	19	12			2			1		4
North Dakota	7		5								
South Dakota	11		2								
Nebraska	15	6	6	4			1				8
Kansas	16	10	19						1		1
SOUTH ATLANTIC											
Delaware	3	1	5								1
Maryland [3]	51	74	74			1					2
District of Columbia	13	12	5								
Virginia	88	38	43	1		43	1		2	1	
West Virginia	12	32	22								
North Carolina	61	76	76					1	1	1	
South Carolina	54	42	38	3					3		1
Georgia	23	7	7		3					5	
Florida	10	21	11	2						1	1
EAST SOUTH CENTRAL											
Kentucky	42	41	23						1	1	
Tennessee	53	38	23	1					2		
Alabama	65	50	21							6	5
Mississippi [3]	4			1						1	
WEST SOUTH CENTRAL											
Arkansas	43	12	14	8		2				1	
Louisiana	14		2		1						
Oklahoma	28	11	5	1	4						
Texas	224	216	145	36	352	33				9	4
MOUNTAIN											
Montana	10	3	3								
Idaho	7	5	3								
Wyoming	1	6	6								
Colorado	84	16	14								5
New Mexico	19	24	3								1
Arizona	39	13	10			16	1				
Utah [3]	10	1	13								2
Nevada											
PACIFIC											
Washington	34	30	32	2							
Oregon	10	5	7	1							
California	105	62	108	4	1						4
Total	2,927	2,664	2,125	94	387	98	9	2	17	27	115
Same week: 1946	2,664			40	265	190	8	1	90	31	123
Median, 1942–46	2,125			31	434	165	7	0	36	76	[6] 94
50 weeks: 1947	149,782			2,916	16,172	9,427	617	567	1,302	1,884	5,905
1946	96,419			2,350	16,007	6,297	600	569	1,052	3,294	5,161
Median, 1942–46	120,814			1,885	17,562	7,344	612	453	772	4,393	[6] 4,947

[3] Period ended earlier than Saturday.

[6] 2-year average, 1945–46.

Anthrax: New York 1, New Jersey 1.

Alaska: Mumps 1.

Territory of Hawaii: Diphtheria 1, amebic dysentery 1, bacillary dysentery 3, influenza 1, leprosy 1, measles 5, endemic typhus fever 2. whooping cough 19.

WEEKLY REPORTS FROM CITIES*

City reports for week ended Dec. 6, 1947

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	------	0	1	0	3	0	0	12
New Hampshire:												
Concord	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	10	0	------	0	56	0	11	1	28	0	0	20
Fall River	0	0	------	0	------	0	0	0	4	0	0	19
Springfield	0	0	------	0	------	0	0	0	1	0	0	21
Worcester	0	0	------	0	1	1	8	0	9	0	0	14
Rhode Island:												
Providence	0	0	------	0	------	0	0	0	2	0	1	16
Connecticut:												
Bridgeport	0	0	------	0	------	0	0	0	1	0	0	1
Hartford	0	0	------	0	3	0	0	0	0	0	0	19
New Haven	0	0	------	0	------	1	0	0	4	0	0	15
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	------	0	9	2	0	0	0	21
New York	9	1	9	0	120	4	66	3	69	0	1	78
Rochester	0	0	------	0	------	0	4	4	3	0	0	10
Syracuse	0	0	------	0	------	0	2	0	4	0	0	16
New Jersey:												
Camden	0	0	1	1	------	0	0	0	0	0	0	2
Newark	0	0	2	0	------	2	2	0	5	0	0	18
Trenton	4	0	------	0	------	1	1	0	1	0	0	------
Pennsylvania:												
Philadelphia	0	0	4	3	12	0	20	1	19	0	0	51
Pittsburgh	1	0	------	0	------	1	13	0	12	0	0	18
Reading	0	0	------	0	3	0	0	0	3	0	0	------
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	------	2	4	2	12	0	0	10
Cleveland	1	0	3	0	------	0	4	0	9	0	0	31
Columbus	6	0	------	0	15	0	2	1	10	0	0	4
Indiana:												
Fort Wayne	0	0	------	0	1	0	1	0	2	0	0	2
Indianapolis	4	0	------	1	------	0	8	0	12	0	0	6
South Bend	0	0	------	0	------	0	0	0	0	0	0	------
Terre Haute	0	0	------	0	------	0	0	0	1	0	0	------
Illinois:												
Chicago	0	0	2	------	111	0	------	2	30	0	1	22
Michigan:												
Detroit	1	0	0	1	9	0	7	0	31	0	0	44
Flint	0	0	------	0	2	0	5	0	9	0	0	5
Wisconsin:												
Kenosha	0	0	------	0	1	0	0	0	1	0	0	2
Milwaukee	0	0	------	0	2	0	2	0	12	0	0	22
Racine	0	0	------	0	1	0	0	0	4	0	0	4
Superior	0	0	------	0	2	0	0	0	0	0	0	5
WEST NORTH CENTRAL												
Minnesota:												
Duluth	1	0	------	0	3	0	1	0	3	0	0	19
Minneapolis	1	0	------	0	282	0	7	0	22	0	0	33
St.Paul	0	0	------	0	4	0	2	0	3	0	0	15
Missouri:												
Kansas City	0	0	3	0	------	0	5	0	5	0	0	16
St. Joseph	0	0	------	0	------	0	0	0	2	0	0	------
St. Louis	5	0	2	0	------	1	9	0	3	0	1	------

---

* In some instances the figures include nonresident cases.

City reports for week ended Dec. 6, 1947—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	0	1	0	1	0	1	0	0	6
Kansas:												
Topeka	0	0	------	0	-------	0	0	0	1	0	0	3
Wichita	0	0	------	0	-------	0	10	0	1	0	0	7
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	-------	0	0	0	0	0	0	------
Maryland:												
Baltimore	3	0	3	2	1	0	6	2	15	0	0	57
Cumberland	12	0	------	0	-------	0	0	0	0	0	0	1
Frederick	0	0	------	0	-------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	4	1	5	1	11	0	0	11
Virginia:												
Lynchburg	0	0	------	0	-------	0	0	0	1	0	0	8
Richmond	0	0	------	0	1	0	4	0	3	0	0	3
Roanoke	1	0	------	0	-------	0	0	0	0	0	0	------
West Virginia:												
Charleston	0	0	------	0	-------	0	4	0	2	0	0	------
Wheeling	0	0	------	0	-------	0	3	0	0	0	0	------
North Carolina:												
Raleigh	0	0	------	0	-------	0	0	0	0	0	0	------
Wilmington	2	0	------	0	-------	0	2	0	0	0	0	------
Winston-Salem	0	0	------	0	-------	0	2	0	3	0	0	------
South Carolina:												
Charleston	0	0	27	0	-------	0	2	0	0	0	0	2
Georgia:												
Atlanta	0	0	1	1	-------	0	4	2	9	0	0	------
Brunswick	0	0	------	0	-------	0	0	0	0	0	0	------
Savannah	0	0	1	0	-------	0	1	0	5	0	0	9
Florida:												
Tampa	2	1	------	0	2	0	2	0	1	0	0	4
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	------	2	12	0	10	0	3	0	0	5
Nashville	0	0	------	0	-------	0	3	0	3	0	0	------
Alabama:												
Birmingham	0	0	5	0	-------	0	0	7	4	0	0	------
Mobile	0	0	2	0	-------	1	2	1	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	1	0	1	0	0	0	0	0	0	------
Louisiana:												
New Orleans	5	0	3	1	-------	1	1	0	5	0	0	1
Shreveport	0	0	------	0	-------	0	4	0	0	0	0	------
Oklahoma:												
Oklahoma City	0	0	8	0	-------	0	3	0	7	0	0	3
Texas:												
Dallas	1	0	------	0	-------	0	1	0	1	0	0	7
Galveston	0	0	------	0	-------	0	1	0	0	0	0	1
Houston	1	0	1	0	7	0	4	0	2	0	0	1
San Antonio	0	0	1	1	-------	0	5	0	1	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	124	0	0	0	2	0	0	------
Great Falls	0	0	------	0	2	0	1	0	1	0	0	------
Helena	0	0	------	0	1	0	1	0	0	0	0	------
Missoula	0	0	------	0	-------	0	0	0	0	0	0	------
Idaho:												
Boise	0	0	------	0	-------	0	2	0	0	0	0	------
Colorado:												
Denver	1	0	2	0	7	1	0	0	10	0	0	12
Pueblo	0	0	------	0	-------	0	1	0	1	0	0	22
Utah:												
Salt Lake City	0	0	------	0	-------	0	2	0	1	0	0	2

City reports for week ended Dec. 6, 1947—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	1	5	1	3	0	4	0	0	8
Spokane	0	0	------	0	9	0	2	1	1	0	0	------
Tacoma	0	0	------	0	12	0	0	0	2	0	0	------
California:												
Los Angeles	4	0	5	0	12	1	0	5	24	0	0	18
Sacramento	0	0	------	0	3	0	1	0	0	0	0	1
San Francisco	0	0	------	0	47	0	3	0	8	0	0	3
Total	75	2	86	14	879	19	290	35	472	0	4	792
Corresponding week, 1946[1]	107	------	47	14	631	------	280	------	464	0	5	670
Average 1942-46[1]	87	------	831	[3] 30	[3] 726	------	[2] 356	------	782	9	11	624

[1] Exclusive of Oklahoma City.
[2] 3-year average, 1944-46.
[3] 5-year median, 1942-46.

Dysentery, amebic.—Cases: New York 9; Minneapolis 1; St. Louis 1; Denver 1; Los Angeles 1.
Dysentery, bacillary.—Cases: Nashville 1; New Orleans 1; Los Angeles 1.
Dysentery, unspecified.—Cases: Cincinnati 6; Baltimore 3; San Antonio 1.
Typhus fever, endemic.—Cases: New York 1; Raleigh 1; Atlanta 1; Dallas 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (latest available estimated population, 34,367,200)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	26.3	0.0	0.0	0.0	158	5.3	52.5	2.6	137	0.0	2.6	360
Middle Atlantic	0.5	0.5	7.4	1.9	62	3.7	54.2	4.6	54	0.0	0.5	99
East North Central	7.5	0.0	3.1	1.9	90	1.2	36.8	3.1	83	0.0	0.6	98
West North Central	12.1	0.0	10.1	0.0	583	2.0	70.4	0.0	82	0.0	2.0	211
South Atlantic	32.7	1.6	52.3	4.9	13	1.6	57.2	8.2	82	0.0	0.0	155
East South Central	5.9	0.0	41.3	11.8	71	5.9	88.5	47.2	59	0.0	0.0	30
West South Central	17.8	0.0	35.6	5.1	20	2.5	48.3	0.0	41	0.0	0.0	33
Mountain	7.9	0.0	15.9	0.0	1,064	7.9	55.6	0.0	119	0.0	0.0	286
Pacific	6.3	0.0	7.9	1.6	139	3.2	14.2	9.5	62	0.0	0.0	47
Total	11.4	0.3	13.1	2.1	134	2.9	44.1	5.3	72	0.0	0.6	120

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—October 1947.—During the month of October 1947, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Residence[1]									
	Panama City		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	7	-------	3	-------	2	-------	2	-------	14	-------
Diptheria	12	-------	-------	-------	-------	-------	7	-------	19	-------
Dysentery:										
Amebic	2	1	-------	-------	-------	-------	6	-------	8	1
Bacillary	-------	-------	-------	-------	-------	-------	1	-------	1	-------
Malaria[2]	6	-------	3	-------	7	-------	265	3	281	3
Measles	2	-------	-------	-------	1	-------	-------	-------	3	-------
Paratyphoid fever	1	-------	-------	-------	1	-------	-------	-------	2	-------
Pneumonia	-------	12	-------	-------	15	1	-------	5	[3] 15	18
Poliomyelitis	-------	-------	-------	-------	1	-------	-------	-------	1	-------
Relapsing fever	-------	-------	-------	-------	-------	-------	1	-------	1	-------
Scarlet fever	1	-------	-------	-------	1	-------	1	-------	3	-------
Tuberculosis	-------	27	-------	9	4	1	-------	4	[3] 4	41
Typhoid fever	1	-------	-------	-------	-------	-------	4	1	5	1
Typhus fever	1	-------	-------	-------	-------	-------	-------	-------	1	-------

[1] If place of infection is known, cases are so listed instead of by residence.
[2] 19 recurrent cases.
[3] In the Canal Zone only.

Puerto Rico

Notifiable diseases—4 weeks ended November 29, 1947.—During the 4 weeks ended November 29, 1947, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chickenpox	7	Syphilis	159
Diphtheria	50	Tetanus	2
Dysentery	1	Tuberculosis (all forms)	878
Gonorrhea	133	Typhoid fever	7
Influenza	127	Typhus fever (murine)	1
Malaria	248	Whooping cough	32
Measles	479		

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended November 22, 1947. During the week ended November 22, 1947, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox	--------	42	1	185	341	41	71	90	70	841
Diphtheria	--------	3	--------	17	5	--------	1	5	--------	31
Dysentery:										
Amebic	--------	--------	--------	--------	1	--------	--------	--------	--------	1
Bacillary	--------	--------	--------	6	--------	--------	--------	--------	--------	6
German measles	--------	--------	--------	4	23	--------	1	14	6	48
Influenza	--------	21	--------	--------	4	--------	--------	--------	12	37
Measles	--------	3	--------	277	142	86	12	10	88	618
Meningitis, meningococcus	--------	--------	--------	--------	--------	--------	--------	1	--------	1
Mumps	--------	36	--------	108	160	22	13	32	24	395
Poliomyelitis	--------	1	--------	1	15	5	2	2	--------	26
Scarlet fever	--------	2	10	67	102	20	1	--------	13	215
Tuberculosis (all forms)	--------	--------	20	112	16	29	14	--------	28	219
Typhoid and paratyphoid fever	--------	--------	--------	8	1	--------	--------	--------	1	10
Undulant fever	--------	--------	--------	3	2	--------	--------	--------	3	8
Venereal diseases:										
Gonorrhea	3	10	9	95	116	18	25	53	70	399
Syphilis	7	8	9	64	51	9	9	9	16	182
Other forms	--------	--------	--------	2	--------	--------	--------	--------	2	4
Whooping cough	--------	--------	--------	66	79	39	15	54	30	283

MEXICO

Guanajuato—Diphtheria.—Information dated December 11, 1947, stated that a severe outbreak of diphtheria was occurring among children in the region of Guanajuato, Mexico.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

Egypt.—For the period December 1–7, 1947, 14 cases of cholera with 7 deaths were reported in all of Egypt. No cases of cholera were reported in any of the ports for this period.

Plague

China—Kiangsi Province.—Information dated December 10, 1947, stated that 96 cases of plague were reported in Shangjao, in the eastern part of Kiangsi Province, China, with a mortality of 75 percent. Twenty cases of plague were also reported in Linchuan, with several additional cases reported in Nanchang.

Smallpox

China—Foochow.—For the period October 21–31, 1947, 48 cases of smallpox with 2 deaths were reported in Foochow, China.

Ecuador—Guayaquil.—Smallpox (alastrim) has been reported in Guayaquil, Ecuador, as follows: Weeks ended—November 22, 1947, 42 cases; November 29, 33 cases.

Malay States (Federated).—For the week ended November 22, 1947, 78 cases of smallpox with 16 deaths were reported in the Federated Malay States.

Paraguay—Asuncion.—For the month of September 1947, 96 cases of smallpox were reported in Asuncion, Paraguay.

Portugal—Lisbon.—For the week ended November 8, 1947, 37 cases of smallpox with 1 death were reported in Lisbon, Portugal.

Typhus Fever

China—Sinkiang Province.—Information dated December 10, 1947, stated that an outbreak of typhus fever had occurred among the Kazaks where about 100 deaths were being reported daily. The disease is said to be spreading in Tihwa, Sinkiang Province.

DEATHS DURING WEEK ENDED DEC. 6, 1947

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Dec. 6, 1947	Corresponding week, 1946
Data for 93 large cities of the United States:		
Total deaths	10,111	9,716
Median for 3 prior years	9,716	
Total deaths, first 49 weeks of year	449,607	441,814
Deaths under 1 year of age	724	761
Median for 3 prior years	640	
Deaths under 1 year of age, first 49 weeks of year	35,895	32,620
Data from industrial insurance companies:		
Policies in force	67,020,343	67,332,394
Number of death claims	13,230	11,963
Death claims per 1,000 policies in force, annual rate	10.3	9.3
Death claims per 1,000 policies, first 49 weeks of year, annual rate	9.2	9.4

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C.: 1948

For sale by the Superintendent of Documents, United States Government Printing Office,
Washington 25, D. C.
Price 10 cents. Subscription price $4.00 a year

Public Health Reports

VOLUME 63 JANUARY 9, 1948 NUMBER 2

IN THIS ISSUE

DDT Dusting and Murine Typhus Fever

Factors Influencing Rabies Vaccine Potency Tests

Incidence of Communicable Diseases in the U. S.

U.S. PUBLIC HEALTH SERVICE
1798

CONTENTS

Page

A preliminary report concerning DDT dusting and murine typhus fever in nine southeastern States. John S. Wiley ... 41
Some factors influencing the mouse potency test for rabies vaccine. Karl Habel and John T. Wright ... 44
Incidence of communicable disease in the United States November 2–29, 1947 ... 55
Comments on the name of the Q fever organism. Cornelius B. Philip ... 58
Deaths during week ended December 13, 1947 ... 58

INCIDENCE OF DISEASE

United States:

Reports from States for week ended December 20, 1947, and comparison with former years ... 59

Weekly reports from cities:

City reports for week ended December 13, 1947 ... 63
Rates, by geographic divisions, for a group of selected cities ... 65

Foreign Reports:

Canada—Provinces—Communicable diseases—Week ended November, 1947 ... 66
Jamaica—Notifiable diseases—4 weeks ended November 29, 1947 ... 66

Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—

Cholera ... 67
Plague ... 67
Smallpox ... 67

Public Health Reports

Vol. 63 • JANUARY 9, 1948 • *No. 2*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

A PRELIMINARY REPORT CONCERNING DDT DUSTING AND MURINE TYPHUS FEVER IN NINE SOUTHEASTERN STATES[1]

By JOHN S. WILEY, *Sanitary Engineer, United States Public Health Service*

On July 1, 1945, an expanded typhus control program in 9 Southeastern States (see table 1) was inaugurated involving primarily the application of 10 percent DDT dust to rat runs, burrows and harborages in an attempt to control human murine typhus fever cases by reducing rat fleas and other rat ectoparasites. The United States Public Health Service, Office of Malaria Control in War Areas,[2] assisted State Health Departments in expanding, recruting and training personnel, and in conducting promotional activities from July to December 1945. A few dusting projects were established in July 1945 and more were added with time so that by March 1946 the full program was in operation. Projects were operated by 122 of the highest typhus reporting counties in 9 States during the entire calendar year 1946 and the first half of 1947. These counties in 1944 accounted for 72.3 percent of all typhus reported in the 9 principal typhus States or 70.5 percent of all typhus reported in the entire United States.

Table 1 and figure 1 show the reported typhus cases by months for the years 1944, 1945, 1946 and the first half of 1947 for the 9 Southeastern States divided into (a) the 122 counties where dusting was conducted from July 1945 through July 1947 and (b) the remaining 460 counties which had no regular DDT dusting programs. The year 1944, the first complete year prior to inauguration of the expanded dusting program, is used as a precontrol or base year for comparing subsequent years.

---

[1] From the Communicable Disease Center, Atlanta, Ga.

[2] Now known as the Communicable Disease Center.

TABLE 1.—*Reported murine typhus fever cases, 9 [1] Southeastern States*

122 COUNTIES WITH DDT DUSTING PROJECTS JULY 1945 THROUGH JUNE 1947

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Percent change from 1944
1944 [2]	151	109	81	113	224	251	503	634	592	398	350	361	3,767	----------
1945 [2]	184	100	110	103	171	331	338	534	492	339	439	222	3,303	−10.7
1946 [3]	163	108	101	97	102	200	247	295	181	130	139	75	1,838	−51.2
1947 [3]	107	102	66	58	76	88			6 months				497	[4]−46.5

REMAINING 460 COUNTIES NOT DDT DUSTED

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Percent change from 1944
1944 [2]	65	42	40	49	70	99	239	212	185	150	155	140	1,446	----------
1945 [2]	96	75	57	62	91	164	223	230	227	145	142	134	1,655	+14.5
1946 [3]	74	76	55	71	70	141	203	199	165	119	101	69	1,343	−7.1
1947 [3]	81	65	85	36	55	79			6 months				01	[4]+9.9

[1] Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Texas.
[2] Source of data—U. S. Public Health Service, Division of Public Health Methods.
[3] Source of data—Monthly reports from State Health Officers, tentative figures.
[4] Computed from first 6 months of 1944.

In the tabulations, no consideration has been given to other typhus control measures in the dusted or the untreated counties, such as ratproofing, rat eradication, general sanitation activities, or other insect and rodent control measures. Such activities might conceivably explain an apparently normal or spontaneous decrease in typhus.

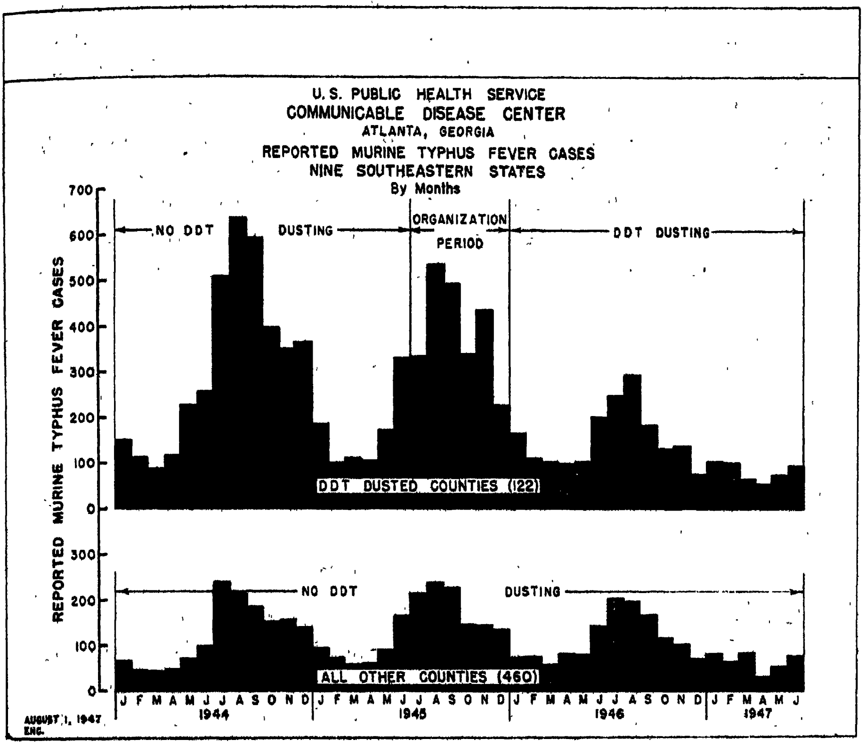


FIGURE 1.

While not much reduction was expected during the organizational period of July–December 1945, a decrease of 10.7 percent in reported typhus occurred for the year in the dusted counties compared to an increase of 14.5 percent in the nondusted counties, a differential of 25.2 percent. A greater differential occurred in 1946 and continued in the first half of 1947, or 44.1 percent and 56.4 percent respectively. In the 10 highest typhus counties the reported cases decreased from 1,074 in 1944 to 395 in 1946 and, in several cases, DDT dusting was the only control measure being applied. Reduction of *X. cheopis*, the Oriental rat flea, has averaged 84 percent in the treated areas on the basis of actual flea counts from over 17,000 live rats.

SOME FACTORS INFLUENCING THE MOUSE POTENCY TEST FOR RABIES VACCINE[1]

By KARL HABEL, *Surgeon*, and JOHN T. WRIGHT, *Surgeon, United States Public Health Service*

In 1940 a mouse test for the potency titration of rabies vaccine was described by Habel (*1*). The Bureau of Animal Industry, United States Department of Agriculture, adopted this test the same year and made it the basis of a minimal potency requirement of all rabies vaccine produced under the Bureau's license for veterinary use. Since that time most of the manufacturers of rabies vaccine for human use have voluntarily tested their products by this method, and in 1945 the Biologics Control Laboratory of the National Institute of Health made this test a part of the minimum requirements for human rabies vaccine. A comparison of the potency tests as performed by commercial laboratories has shown that in different laboratories marked variations occur between the titers of the challenge viruses and the amount of protection afforded by vaccines against these viruses. Furthermore, within any one laboratory less marked but often definite quantitative differences occur in tests on different lots of vaccine.

The work to be reported in this paper represents an attempt to determine the causes of these variations and to devise means of eliminating them.

General Considerations

Certain problems related to the titration of fixed rabies virus in normal and in vaccinated mice, as well as the problem of obtaining uniform results in identical mouse potency tests are well known to workers in the field of rabies and are of sufficient importance to the present study to warrant emphasis.

The titration of a fixed virus intracerebrally in nonimmunized mice must be with at least tenfold dilution differences if the spread of mortality from 100 percent to 0 is to be within 3 dilutions. On the other hand, titration of fixed virus intracerebrally in immunized mice, even at tenfold dilution differences, often results in an end point spread over more than 3 dilutions. This spreading of end point is more marked with vaccines of intermediate potencies than with those having very high or very low values. A consistent characteristic of the mortality curve with vaccines of intermediate potency is the high point near the middle when unaccumulated mortalities are plotted against increasing challenge virus dilutions. A typical curve is shown in figure 1. This shows the mortality of immunized mice receiving the 10^{-1} dilution of challenge virus as lower than in those mice challenged with the 10^{-3}

---

[1] From the Division of Infectious Diseases and the Biologics Control Laboratory, National Institute of Health.

dilution. One explanation for this phenomenon may be that a prolonged incubation period, such as occurs in rabies, provides sufficient time for the larger infecting doses to act as a booster dose to the previous immunization. The character of this curve as regards amplitude, spread, and the position of the hump in reference to virus dilution is found to be correlated with the balance between the antigenicity of the vaccine and the titer of the challenge virus.

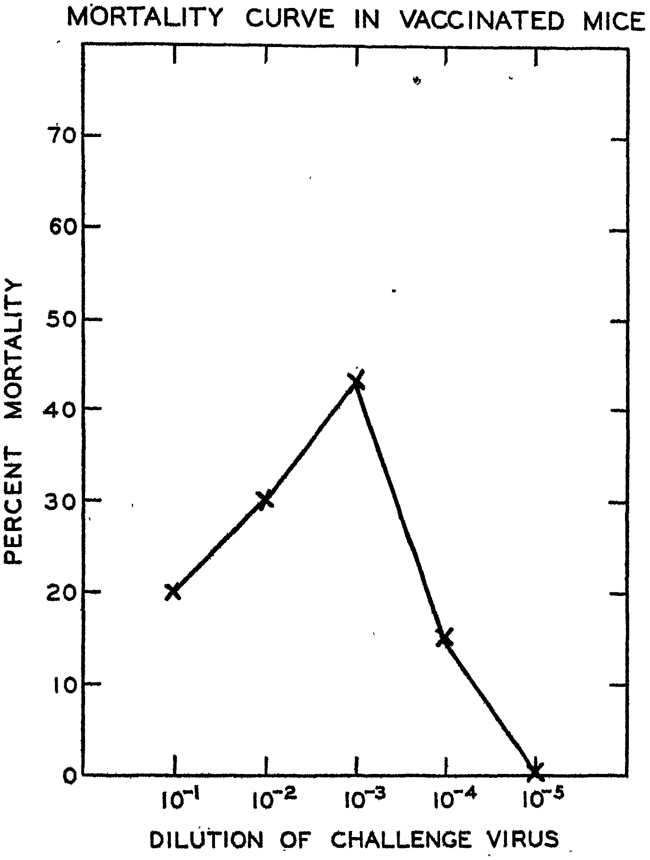


FIGURE 1.

It has been shown by an analysis of many protocols that with any one technician the results of duplicate testing are consistent when using the same vaccine, the same strain of pooled challenge virus, and 1 strain of mice with at least 10 immunized mice on each challenge virus dilution. The uniformity of results of identical tests varies directly with the potency of the vaccine being tested. In general, any vaccine having a potency of 10,000 LD_{50} or over should vary less than 50 percent from the average potency of duplicate tests. Among the factors possibly responsible for variations in results from test to test and laboratory to laboratory would then appear to be differences due to the technician, to the strain of mice, and strain of test virus.

Experimental Work

Variations due to technician differences.—A check on the variations in the result of rabies vaccine potency tests due to technician differences was made in three separate studies. The first two studies were participated in by seven different laboratories, including both commercial and research laboratories. Each laboratory was supplied the same lot of phenolized vaccine, the same strain of heterologous fixed challenge virus, the same diluent for virus titration, and the same strain of mice. Mice were immunized and given the challenge virus at the same time in each laboratory. As seen in table 1 the vaccine in the first test was of very low potency while that in the second test was high. The results with the low-potency vaccine were consistent in all of the seven participating laboratories while the results with the more potent vaccine were in agreement in five of the seven laboratories in spite of some variation in challenge virus titers in control mice.

TABLE 1.—*Potency test results in 7 different laboratories with 1 vaccine of low and 1 of high potency*

Laboratory	Vaccine 1			Vaccine 2		
	Log of 50 percent end point		LD$_{50}$ protection	Log of 50 percent end point		LD$_{50}$ protection
	Control mice	Immunized mice		Control mice	Immunized mice	
1	5.539	5.545	0	7.451	3.000	28,320
2	>7.000	>6.000	<10	7.155	2.875	19,161
3	>6.000	5.445	>5	8.000	3.639	23,133
4	3.612	3.567	0	5.950	2.955	989
5	>7.000	5.429	>37	7.457	2.563	78,683
6	5.834	4.617	16			
7	5.859	5.616	2			
8				7.322	>6.000	<21
9				5.500	<1.000	>31,600

The third study on variations of potency due to technician differences was between technicians from two laboratories using a single vaccine, a homologous and a heterologous challenge virus, and two strains of mice. These tests were performed simultaneously in one laboratory with each technician making his own serial dilutions of challenge virus. This study, as shown in table 2, actually tested the technician's influence in four separate tests. In only 1 of these four comparisons was one technician's result under the minimum National Institute of Health potency requirement and the other technicians' results over that level. These comparisons were with a vaccine of relatively low potency.

Variations due to strain of mice.—Leach and Johnson (*2*) investigated the susceptibility of a number of strains of mice to fixed rabies virus when injected intracerebrally and found no significant differences. Little work has been done on the influence of the mouse strain on the immunity response. Habel (*3*) found no marked differences between strains of Swiss mice of the same age and weight, while Casals-Ariet and Webster (*4*) did show differences in a single strain due to age alone.

A check on the different responses of two strains of mice to a single vaccine, as shown in table 2, was done in four ways. Definite and consistent differences were demonstrated in the immunity response of the two strains of mice by both technicians when using both challenge viruses. One mouse strain consistently responded with low immunity to the intracerebral challenge virus. The only obvious difference in this group of mice was the lower average weight at 6 weeks of age, the age of the mice at the time the challenge dose was given.

TABLE 2.—*Potency of a phenolized rabies vaccine when tested by two technicians in 2 strains of mice with homologous and heterologous challenge viruses*

Technician	Strain of mice	Strain of virus	Log 50 percent end point		LD_{50} protection
			Control mice	Immunized mice	
1	A	[1] He	6.33	3.088	1,750
2	A	He	6.896	2.41	30,600
1	B	He	5.823	4.00	66
2	B	He	6.915	4.277	430
1	A	*Ho	5.65	1.857	7,200
2	A	Ho	6.33	2.287	11,100
1	B	Ho	5.73	3.865	73
2	B	Ho	6.39	3.062	2,130

[1] He Heterologous virus strain to vaccine.
*Ho Homologous virus strain to vaccine.

Variations due to strain of challenge virus.—When check tests were made in this laboratory on commercial vaccines, differences in results from test to test due to technician and mice were minimized, since the same person performed all the tests and the same breed of mice was always used. In order to measure the effect of methods of preparing challenge virus upon the uniformity of the results a series of experiments was conducted to determine the relative efficiency of various methods of releasing virus from the infected mouse-brain suspensions. Various methods of grinding (including powdering while in the frozen state) various diluents and the exposure of the suspensions to supersonic vibration resulted in no significant increase in the yield of virus in the supernatant fluids. It was shown that once virus was released from its intracellular position its adsorption on cellular debris and its subsequent removal by centrifugation were the chief factors limiting the amount of virus present in supernatant fluid.

To make the challenge virus more uniform from test to test, a single pool of infected mouse brains was emulsified and a 20-percent whole brain suspension in 10-percent horse serum and distilled water was prepared. This was stored in small amounts of flame-sealed glass ampoules at minus 70° C. As each test was performed the challenge virus in several ampoules was pooled if the amount in each ampoule was insufficient. One lot was used over a period of 10 months on 20 potency tests and a second lot over a 12-month period on 15 tests. It can be seen from table 3 that the titer of any one pool of challenge virus kept in this manner varied less than a tenfold dilution in either direction from the average titer during the periods in which it was checked.

TABLE 3.—*Log of titers of 2 challenge virus pools showing stability of the virus*

Lot 1 H		Lot 2 H	
Date	Log of titer	Date	Log of titer
1945		*1945*	
June 12	4.934	Dec. 12	6.000
July 10	5.552	Dec. 14	5.937
		1946	
Aug. 8	5.882	Jan. 15	6.000
Aug. 14	5.342	Mar. 19	6.500
Aug. 20	5.191	Mar. 26	6.449
Aug. 29	5.500	Apr. 4	6.252
Sept. 26	5.862	Apr. 5	6.293
Do	5.418	Apr. 15	6.500
Sept. 27	5.656	June 18	5.600
Oct. 2	5.624	Aug. 20	6.500
Oct. 17	5.392	Sept. 10	6.567
Do	5.626	Sept. 24	6.107
Oct. 19	6.000	Do	5.500
Oct. 23	5.500	Nov. 15	6.113
Nov. 23	5.334	Dec. 20	6.700
1946			
Feb. 4	5.760		
Do	5.267		
Feb. 18	5.500		
Mar. 19	5.720		
Apr. 23	5.254		

This standardization of the technique used within the test laboratory tended to smooth out differences in potency titrations from lot to lot of an individual producer's vaccine, but there still remained definite differences between producers. Likewise, potency differences were obtained between titrations performed by the producer and by one of us, as is shown in table 4.

A further check of the influence of the challenge virus strain upon the results was next considered since tests in the producing laboratory had been performed with a homologous challenge virus whereas in our check tests a heterologous challenge virus was used. Fixed viruses from 5 producing laboratories were obtained and these, together with the N. I. H. strain of fixed virus, were given 3 to 4 intracerebral passages in mice. Seventy-five to one hundred mice were then inoculated intracerebrally with each virus strain, and separate 10 percent brain suspensions were made from each group of mice. Part of each virus suspension was made into a vaccine by inactivating with ultraviolet radiation (*5*). The remainder was stored in flame-sealed ampoules at minus 70° C. to be used later as challenge virus. A 6-way cross immunization experiment was then carried out in which 6 groups of mice were immunized with each vaccine and each of the 6 groups tested by each of the 6 viruses. Thus a total of 36 potency tests were performed in the one experiment. After the results of this cross immunity test were found to show differences in properties of the viruses, the entire experiment was repeated using the same 6 viruses for confirmation.

TABLE 4.—*Comparison of N. I. H. check potency testing using an HETEROLOGOUS virus with the potency tests of the producing loboratory using HOMOLOGOUS virus*

Laboratory	Lot	Log of NIH control titer	Log of NIH protection	Log of producer control titer	Log of producer protection
1	a	4.934	2.96	6.645	4.158
	b	5.500	2.44	6.285	4.721
	c	5.500	1.85	6.782	4.669
	d	5.500	1.93	6.285	4.285
2	a	4.934	2.98	6.389	3.278
	b	4.934	3.10	6.389	4.723
	c	5.551	2.32	6.363	3.363
	d	5.882	3.07	6.363	3.363
	e	5.342	2.80	6.499	4.240
	f	5.342	2.21	6.499	3.298
3	a	4.934	3.08	5.369	3.939
	b	5.551	3.97	5.499	4.499
	c	5.882	4.88	5.000	4.000
4	a	5.551	3.518	7.000	5.421
	b	5.551	4.55	7.000	3.369
	c	5.551	3.30	6.714	3.155
	d	5.551	4.13	7.320	3.363
	e	5.342	4.34	7.136	3.850
	f	5.342	3.43	7.155	4.338
5	a	5.551	2.18	6.346	3.721
	b	5.342	2.66		
	c	5.501	1.77		
6	a	5.501	2.76		
	b	5.342	2.26	11.00	7.00
	c	5.342	2.85	11.00	8.00
7	a	5.882	2.55	7.00	4.264
	b	5.882	2.88	6.130	3.719
	c	5.882	3.23	6.130	3.804
	d	5.882	3.48	7.000	4.257
	e	5.882	2.79	7.000	5.000
8	a	5.501	4.34	6.701	4.164

The technique of performing these potency tests is outlined below under the standard potency test. Each vaccine was challenged from the same set of serial tenfold dilutions of each virus in order that the results of the tests would be comparable. The results are presented in table 5. From a study of the results it is obvious that there are differences in these viruses. These may be divided into antigenic and challenge virus differences. Figure 2 presents in graphic form the challenge virus differences. This graph compares the LD_{50} protection of all six vaccines against each virus and shows the differences that exist, for example, between viruses I and IV. When used as challenge virus, virus I demonstrated uniformly low potency and virus IV demonstrated uniformly high potency of all vaccines. This difference in the ability of two viruses to overcome the same degree of immunity in vaccinated mice has arbitrarily been designated as a difference in invasiveness. Thus, virus I is the most invasive while virus IV is the least invasive of the six virus strains tested.

TABLE 5.—*Results of 2 complete cross immunity tests using the intracerebral challenge technique*

	Intracerebral potency test A				Intracerebral potency test B			
	Log of challenge virus control titer	Log of AEP [1] of vaccine	Log of protection	LD$_{50}$ protection	Log of challenge virus control titer	Log of AEP [1] of vaccine	Log of protection	LD$_{50}$ protection
I VACCINE vs.								
Virus I	6.823	3.325	3.498	3,150	5.354	1.476	3.878	7,560
Virus II	6.829	3.471	3.358	2,280	6.287	4.159	2.128	134
Virus III	7.000	2.578	4.422	26,400	6.166	1.757	4.409	25,700
Virus IV	6.834	1.000	5.834	683,000	5.593	1.400	4.193	15,600
Virus V	7.286	5.000	2.286	193	6.116	4.291	1.825	66
Virus VI	7.315	3.074	4.241	17,400	5.641	3.416	2.225	167
II VACCINE vs.								
Virus I	6.823	4.000	2.823	666	5.354	2.889	2.465	292
Virus II	6.829	1.334	5.495	313,000	6.287	1.757	4.530	34,200
Virus III	7.000	<1.000	>6.000	>1,000,000	6.166	1.500	4.666	46,400
Virus IV	6.834	1.000	5.834	683.000	5.593	<1.000	>4.593	>39,200
Virus V	7.286	1.260	6.026	1,010,000	6.116	<1.000	>5.116	>130,000
Virus VI	7.315	2.500	4.815	65,400	5.641	1.346	4.295	19,700
III VACCINE vs.								
Virus I	6.823	4.172	2.651	448	5.354	3.400	1.954	90
Virus II	6.829	1.291	5.538	345,000	6.287	2.000	4.287	19,400
Virus III	7.000	<1.000	>6.000	>1,000,000	6.166	<1.000	>5.166	>146,000
Virus IV	6.834	<1.000	>5.834	>683,000	5.593	<1.000	>4.593	>39,200
Virus V	7.286	3.889	3.397	2,500	6.116	2.399	3.717	5,220
Virus VI	7.315	2.462	4.853	71,300	5.641	1.440	4.201	15,900
IV VACCINE vs.								
Virus I	6.823	3.889	2.934	859	5.354	4.518	0.836	1.2
Virus II	6.829	2.138	4.691	41,900	6.287	2.500	3.787	6,130
Virus III	7.000	3.883	3.117	1,310	6.166	1.537	4.629	42,600
Virus IV	6.834	<1.000	>5.834	>683,000	5.593	<1.000	>4.593	>39,200
Virus V	7.286	3.250	4.036	10,100	6.116	2.826	3.290	1,950
Virus VI	7.315	2.834	4.481	30,300	5.641	2.600	3.041	1,010
V VACCINE vs.								
Virus I	6.823	3.060	3.763	5,800	5.354	2.400	2.954	900
Virus II	6.829	<1.000	>5.829	>675,000	6.287	1.500	4.787	61,300
Virus III	7.000	<1.000	>6.000	>1,000,000	6.166	<1.000	>5.166	>146,000
Virus IV	6.834	<1.000	>5.834	>683,000	5.593	<1.000	>4.593	>39,200
Virus V	7.286	1.240	6.046	1,010,000	6.116	<1.000	>5.116	>130,000
Virus VI	7.315	<1.000	>6.315	>2,060,000	5.641	1.291	4.350	22,400
VI VACCINE vs.								
Virus I	6.823	4.230	2.593	392	5.354	2.667	2.687	487
Virus II	6.829	2.700	4.129	13,400	6.287	2.375	3.912	8,170
Virus III	7.000	<1.000	>6.000	>1,000,000	6.166	1.000	5.166	146,000
Virus IV	6.834	<1.000	>5.834	>683,000	5.593	<1.000	>4.593	>39,200
Virus V	7.286	4.291	2.995	989	6.116	3.272	2.844	699
Virus VI	7.315	1.000	6.315	2,060,000	5.641	<1.000	>4.641	>43,800

[1] AEP=Arithmetic end point.

Figure 3 represents a comparison of the viruses on an antigenic basis. This graph presents the number of LD$_{50}$ protection afforded by any one vaccine when challenged with each of the six viruses. It is seen that vaccines vary not only in the total number of LD$_{50}$ protection against any one challenge virus but also in their ability to protect against a number of different challenge viruses. Thus the vaccine made from virus V is the most antigenic and that from virus I the least antigenic.

The results of the two experiments are presented in figures 2 and 3 only to emphasize the similarity of relationship between the virus strains. No comparison should be made of the actual number of LD_{50} protection between the two tests since two separate sets of vaccines and challenge viruses were used.

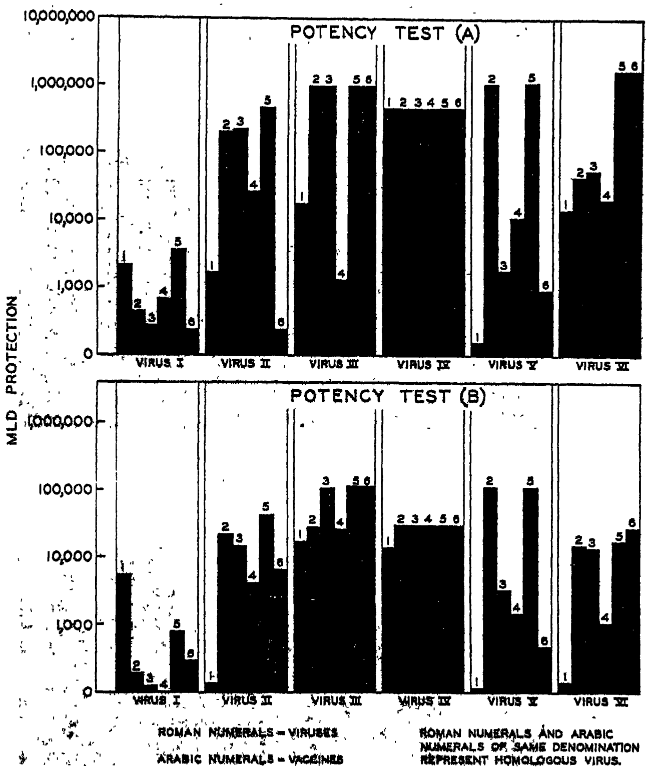


FIGURE 2.—Graphic comparison of cross immunity tests with 6 strains of rabies fixed virus, using the mouse intracerebral potency test in two complete studies.

Discussion

The variations in the results obtained with the mouse potency test of rabies vaccine have been studied from the standpoint of factors influencing the test, such as technician, strain of mice, and strain of test virus. Slight differences may be found due to the individual techniques of the workers but these differences are usually no greater than those to be expected if one individual were to run tests in duplicate. Previously it had been thought that a difference in the age of the mice was the only factor in the test animal that would influence results. However, the results of four comparisons of two strains of Swiss mice of the same age have demonstrated that, at the age of four weeks, strains of mice may vary in their ability to be immunized with a particular rabies vaccine using the technique employed in the standard test. Further work in evaluating this mouse factor is indicated. Any laboratory experiencing difficulty in obtaining satisfactory potency levels should investigate the ability of the strain of mice used to respond to immunization as compared to other strains of Swiss mice.

The marked variations in the results of the potency test obtained with a single vaccine, when the immunized mice are challenged with different strains of challenge virus, have been brought out in these experiments. A given vaccine could be demonstrated to be of very low or of very high potency depending upon whether a highly invasive virus or one of low invasiveness was used as challenge material. This wide variation in invasiveness (the ability of different fixed virus strains to cause rabies in immunized mice) might not be so surprising if the strains used were of different origin. The history of the six strains used shows them to be substrains of the original Paris (Pasteur) fixed rabies virus. They have been carried in different laboratories over a period of years by different individuals using different intracerebral passage techniques. Therefore, any differences in their present characteristics must have occurred through repeated animal passages over a long period of time.

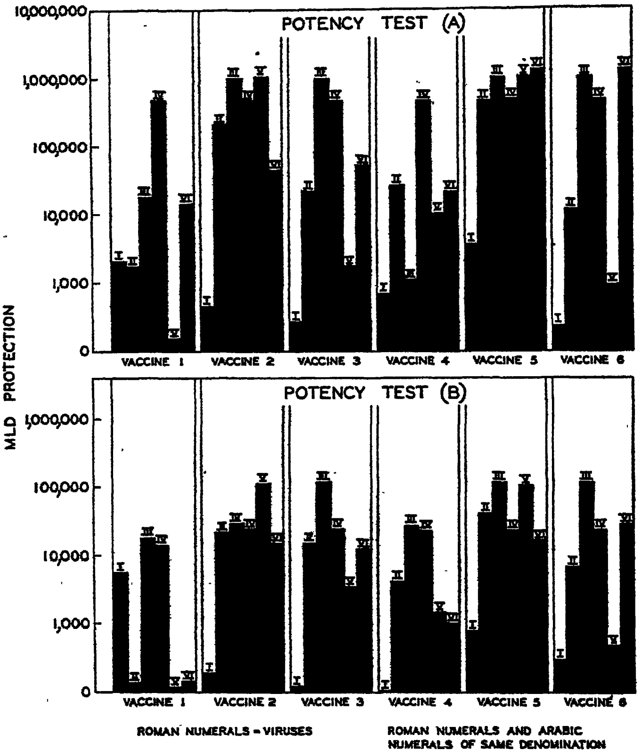


FIGURE 3.—Graphic comparison of cross immunity tests with the antigens of six strains of rabies fixed virus, using the intracerebral potency test in mice, in two complete studies.

The use of a standard challenge virus as a means of eliminating virus variations from routine potency testing is needed. It has been shown that pooled frozen virus will hold its titer for at least 10 months with relatively slight variation in the titration end points from test to test. To further reduce the possibility of a standard virus changing its characteristics because of animal passage in different laboratories, the number of passages of the reference standard challenge virus actually used in potency testing should be held to a minimum.

In order to further eliminate those factors which have been shown by the present study to cause variations in the results of the potency tests, it is necessary to standardize the technique of the test. This has been attempted by specifying in the minimum requirements for rabies vaccine the details of an acceptable test. These are as follows:

DETERMINATION OF POTENCY

The reference standard challenge virus.—A standard challenge virus will be supplied by the National Institute of Health as needed, but preferably only on request at approximately yearly intervals. This will provide a nearly uniform challenge virus and make possible the evaluation of different lots of vaccines as well as vaccines of different laboratories. It is urged that each laboratory follow closely the procedures outlined.

The working standard challenge virus.—The standard challenge virus will be supplied as a 20 percent mouse brain suspension in a 10 percent horse serum aqueous diluent. This has been stored prior to shipment under dry ice and should be used only if received in the frozen state and should be retained in this condition until used. The contents of the ampoule should be thawed rapidly with agitation while held under cold running water and then diluted 1:2 with the 10 percent horse serum diluent. This gives a 10 percent, or 10^{-1}, suspension and is centrifuged for 10 minutes at not less than 1,000 r. p. m. The supernate is diluted to 10^{-3}, and using this dilution as the inoculating dose a sufficient number of normal, unused mice are injected with 0.03 ml. intracerebrally to produce the amount of working standard challenge virus needed for approximately 1 year. (One mouse brain will yield approximately 1.5 ml. of a 20 percent suspension). When an inoculated mouse has shown symptoms of rabies for a period of 24 hours the brain is harvested and immediately frozen with dry ice. The harvested brains are placed in a common container and when the collection is complete they are thawed, weighed, ground to pulp, and enough of the 10 percent horse serum diluent added slowly while grinding to yield a 20 percent final suspension. The suspension is given a lot number and without straining or centrifuging it is distributed into ampoules, using 2.0–2.5 ml. to each ampoule. The ampoules are flame-sealed, the contents shell-frozen, and stored at dry ice temperature (approximately minus 70° C.). Each step in preparing the working standard challenge virus must be carried out promptly so as to insure the survival of the maximum possible amount of virus. Before using as challenge virus, the LD_{50} value of the lot should be determined in mice 6 weeks old. The lot is satisfactory providing the LD_{50} value occurs between the $10^{-5.0}$ and $10^{-8.0}$ dilutions, inclusive. When all of the ampoules of a lot have been used, or at the end of a 1-year expiration date, a new reference standard challenge virus shall be obtained from the National Institute of Health for preparing a new lot of working standard challenge virus. This is essential in order to assure uniformity of the working standard challenge virus throughout production.

Dilution of the challenge virus.—One ampoule of the pooled first passage working standard challenge virus is thawed rapidly with agitation under cold running water and diluted 1:2 with a 10-percent horse serum aqueous diluent. This mixture is then centrifuged for 10 minutes at not less than 1,000 r. p. m. The supernate is a 10^{-1} dilution of the challenge material and is used to make serial tenfold dilutions of 10^{-2}, 10^{-3}, 10^{-4}, 10^{-5}, 10^{-6}, 10^{-7} and 10^{-8}. All dilutions are made in the same diluent as originally used. It is recommended that the dilutions of the challenge virus be held in an ice and salt mixture, or its equivalent, during the performance of the test in order to prevent potency loss. However, the challenge virus suspensions should not be allowed to freeze.

Type of test mouse.—The test is based on the use of white Swiss mice of either sex approximately 4 weeks old, uniform in weight (11–13 gm.). Mice of only one sex may be used if preferred.

Immunization of the mice.—It is recommended that at least 10 mice be used for each dilution in the test group and at least 10 mice for each dilution in the control group. The mice intended for the test group are each given 0.25 ml. of the diluted vaccine intraperitoneally every second day for 6 doses. The vaccine to be tested is first diluted so as to represent a 0.5 percent suspension of the brain tissue used in making the vaccine.

Challenge of the control and test mice.—The test mice are ready for the challenge dose 14 days after the first of the 6 immunizing injections. Three groups of 10 control mice each, which were set aside at the beginning of the test, are given 0.03 ml. intracerebrally of at least 3 tenfold dilutions of the challenge virus in order to determine which dilution represents 1 LD_{50}. If the virus is fully active and the dilution range selected is correct, a 3 tenfold range usually will pass from 100 percent deaths to 100 percent survivals. The potency of the challenge virus for each potency test should have a calculated LD_{50} value of not less than $10^{-5.0}$ or greater than $10^{-8.0}$. In addition, the maximum variation of the control LD_{50} from test to test in any given laboratory and with the same lot of challenge virus should not exceed two tenfold dilutions. The LD_{50} value is determined by including in the calculations all specific deaths occurring in all dilutions used. Scattered deaths should be viewed with suspicion. At the same time the immunized mice are divided into 5 groups of 10 mice each and are injected intracerebrally with 0.03 ml. of 10^{-1}, 10^{-2}, 10^{-3}, 10^{-4}, and 10^{-5} dilutions of the challenge virus. Vaccinated mice are always inoculated first and then the controls. The order of inoculation in both groups should be from the highest to the lowest dilutions. All mice are observed for 14 days from the time of the challenge injection. Only those deaths occurring after the fifth day and those preceded by symptoms of fixed virus rabies (paralysis, convulsions) are considered rabies deaths. Any mice becoming paralyzed but surviving the 14-day observation period are considered the same as rabies deaths.

Calculation of the potency.—Fifty percent end points are determined for both the controls and the vaccinated mice by the method of Reed and Muench (6). By dividing the 50 percent end-point dilution of the controls (representing 1 LD_{50}) by the 50 percent end-point dilution of the vaccinated group, the number of LD_{50} protection is obtained.

Antigenic value.—The finished vaccine shall be capable of stimulating a degree of immunity in the test mice, following the course of immunizing injections outlined, which will protect the mice against a challenge dose of not less than 1,000 LD_{50} of standard challenge virus when injected as prescribed in the test.

Acknowledgments

The authors take pleasure in expressing appreciation to the following laboratories for their cooperation in obtaining some of the data here presented: Alabama State Department of Health; Bureau of Animal Industry of the United States Department of Agriculture; Georgia State Department of Health; Rockefeller Laboratories, Alabama; Rockefeller Laboratories, New York; Sharp and Dohme; and Wyeth, Inc.

References

(*1*) Habel, Karl: Evaluation of a mouse test for the standardization of the immunizing power of antirabies vaccines. Pub. Health Rep., **55**: 1473–1487, 1940.

(*2*) Johnson, H. N., and Leach, C. N.: Comparative susceptibility of different strains of mice to rabies virus. Am. J. Hyg., **32**: 38–45, sec. b, 1940.

(*3*) Habel, Karl: Influence of virus strain on efficiency of rabies vaccine. Pub. Health Rep., **55**: 1619–1631, 1940.

(*4*) Casals-Ariet, J., and Webster, L. T.: Age factors in susceptibility and immunizability of mice to rabies virus. J. Bact., **39**: 66, 1940.

(*5*) Levinson, S. O., Milzer, A., *et al.*: A new method for the production of potent inactivated vaccines with ultraviolet irradiation. J. Immunol., **50**: 317–329, 1945.

(*6*) Reed, L. J., and Muench, H.: A simple method of estimating fifty percent endpoints. Am. J. Hyg., **27**: 493–497, 1938.

INCIDENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

November 2–29, 1947

The accompanying table summarizes the incidence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in PUBLIC HEALTH REPORTS under the section "Incidence of Disease." The table gives the number of cases of these diseases for the 4 weeks ended November 29, 1947, the number reported for the corresponding period in 1946, and the median number for the years 1942–46.

DISEASES ABOVE MEDIAN INCIDENCE

Influenza.—A total of 8,963 cases of influenza was reported for the 4 weeks ended November 29. The 1942–46 median for the corresponding period was 8,662 cases which was represented by the 1946 incidence. A slight excess over the 5-year median was reported in the South Atlantic and South Central sections, but in all other sections the incidence was below the median seasonal expectancy. Of the total cases Texas reported 4,199, South Carolina 1,754 and Virginia 1,056, those States being mostly responsible for the relatively high incidence in the sections in which they are located.

Whooping cough.—While this disease has dropped from the high level reached earlier in the season, the current incidence was 1.4 times the 1946 incidence during the same 4 weeks, and about 11 percent above the median for the preceding 5 years. An excess over the normal seasonal incidence was reported from all sections except the Middle Atlantic and Pacific; in those sections the number of cases was slightly lower than the normal seasonal incidence.

DISEASES BELOW MEDIAN INCIDENCE

Diphtheria.—For the 4 weeks ended November 29 there were 1,387 cases of diphtheria reported, as compared with 1,514 in 1946 and a 1942–46 median of 1,828 cases. After a slight rise in the incidence of diphtheria during 1945 and the first 6 months of 1946 the number of cases started to decline again and the current incidence was the lowest on record for these 4 weeks in any year for which data are available in this form. In all sections except the South Atlantic the current incidence either fell below or closely approximated the median. The recent rise was first reported from the South Atlantic and South Central sections and it is significant that the number of cases (440) reported in the South Atlantic section was higher than in 1946 and 1.2 times the median for the 5 preceding years; in the South Central sections the incidence was relatively low during the current 4-week period.

Measles.—The number of cases of measles (7,855) was 1.3 times the 1946 figure for these same 4 weeks, but it was slightly below the 1942–46 median. Michigan (2,132 cases) in the East North Central section, and Minnesota (756 cases) in the West North Central section were mostly responsible for the excesses in those sections over the medians for the preceding 5 years. Minor excesses were reported from the South Atlantic and West South Central sections, but in the other 5 sections the incidence was relatively low.

Meningococcus meningitis.—The incidence of this disease continued at a relatively low level. The 207 cases reported for the 4 weeks ended November 29 was about 83 percent of that for the corresponding period in 1946 and 52 percent of the median for the preceding 5 years. In each section of the country the number of cases was comparatively low and for the country as a whole the current incidence was the lowest since 1941 when 145 cases were reported for the corresponding 4 weeks.

Poliomyelitis.—The number of cases of poliomyelitis dropped from 1,638 during the preceding 4 weeks to 896 for the 4 weeks ended November 29. The late persistence of this disease in some States has retarded somewhat the rate of seasonal decline, but the current incidence was only about 57 percent of that reported during the corresponding 4 weeks in 1946 and it was slightly lower than the 1942–46 median. Of the total cases Ohio reported 121, New York 104, Idaho 75, California 67, North Carolina 57 and Illinois and Michigan 44 each. In sections that did not include any of the above mentioned States the incidence was either below the 5-year median or was only slightly above it.

Scarlet fever.—This disease continued at a relatively low level. For the 4 weeks ended November 29 the number of cases (5,941) was 84 percent of the number reported for the corresponding period in 1946 and about 55 percent of the median for the preceding 5 years. For the country as a whole the current incidence was the lowest reported during these same weeks in the 19 years for which data are available in this form.

Smallpox.—Five cases of smallpox were reported during the current 4-week period (one each in South Dakota, West Virginia, Kansas, Wyoming, and New Mexico), the number being the lowest on record for this period. The median for the preceding 5 years was 24 cases which represents the 1945 incidence for this period.

Typhoid and paratyphoid fever.—The number of cases (256) of these diseases was slightly higher than in 1946 but it was 84 percent of the median for the preceding 5 years. The South Atlantic section reported a few more cases than might be expected, but in all other sections the incidence was about normal or relatively low. These diseases have been on the decline since 1939 and while it may be significant that for the past three 4-week periods the incidence has been higher than in 1946, the incidence was lower for these periods than in any preceding year.

MORTALITY, ALL CAUSES

For the 4 weeks ended November 29 there were 36,144 deaths from all causes reported to the National Office of Vital Statistics by 93 large cities. The median for the preceding 5 years was 35,242 deaths. For the first and last weeks of the current 4-week period the number of deaths was lower than the preceding 3-year median, but during the second week the number was 5.7 percent higher than the median and in the second week the number was 7.9 percent higher than the median.

Number of reported cases of 9 communicable diseases in the United States during the 4-week period Nov. 2–29, 1947, the number for the corresponding period in 1946, and the median number of cases reported for the corresponding period, 1942–46

Division	Current period	1946	5-year median	Current period	1946	5-year median	Current period	1946	5-year median
	Diphtheria			Influenza [1]			Measles		
United States	1,387	1,514	1,828	8,963	8,662	8,662	7,855	5,900	8,146
New England	34	88	44	14	12	36	176	1,883	1,457
Middle Atlantic	142	164	142	24	42	76	1,036	1,402	1,992
East North Central	188	195	181	112	128	232	3,451	708	880
West North Central	85	125	159	82	22	95	1,160	121	222
South Atlantic	440	338	365	2,977	2,452	2,452	618	751	434
East South Central	184	223	223	378	224	275	114	106	153
West South Central	186	208	347	4,758	5,139	4,037	289	287	245
Mountain	76	67	70	535	574	659	456	330	683
Pacific	52	106	122	83	69	128	555	402	977
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	207	250	397	896	1,581	932	5,941	7,051	10,714
New England	15	19	49	34	91	52	499	581	977
Middle Atlantic	39	54	98	164	167	158	1,109	1,339	1,765
East North Central	43	43	96	239	442	147	1,553	2,306	2,864
West North Central	16	25	35	61	372	73	645	528	1,098
South Atlantic	24	24	53	126	102	56	656	630	1,446
East South Central	18	20	40	59	53	39	407	403	707
West South Central	21	20	32	18	153	64	239	231	526
Mountain	11	8	11	93	51	30	297	285	409
Pacific	20	37	44	102	150	150	536	748	1,224
	Smallpox			Typhoid and paratyphoid fever			Whooping cough		
United States	5	16	24	256	229	304	10,425	7,703	9,377
New England	0	0	0	14	21	16	1,410	1,020	1,162
Middle Atlantic	0	0	0	28	23	38	1,933	2,094	2,112
East North Central	0	5	8	27	26	31	2,639	2,282	2,282
West North Central	2	3	6	13	13	14	659	225	433
South Atlantic	1	1	1	59	29	43	1,265	814	983
East South Central	0	3	3	22	22	31	388	182	371
West South Central	0	3	4	58	52	70	1,129	627	627
Mountain	2	0	2	10	15	29	524	181	808
Pacific	0	1	1	25	28	22	478	278	587

[1] New York, North Carolina, and Pennsylvania excluded; New York City and Philadelphia included.

COMMENTS ON THE NAME OF THE Q FEVER ORGANISM

By Cornelius B. Philip, *Principal Medical Entomologist, United States Public Health Service* [1]

The classification of the rickettsiae has been undergoing revision as research continues to clarify relationships of the pathogenic forms. At the time of the proposal of the name *Coxiella* as a subgenus of *Rickettsia* for the etiologic agent of Q fever, *R. burneti*, it appeared desirable to use subgenera as a useful systematic category for distinct groups within the genus. Notwithstanding Bengtson's recent complete synonymizing of *Dermacentroxenus* with *Rickettsia*, the writer still feels that the name has utility as a subgenus to denote the increasing number of rickettsiae related through capabilities of invasion of the nuclei of certain host cells. The subgeneric level is recognized in the present bacteriological system in other families. However, it was originally recognized and stated that *Coxiella* possessed certain striking characters that might eventually warrant its full generic recognition. Steinhaus and others have recommended this action, and the writer has been using the name as a full genus in unpublished tables for teaching and other purposes during the War. It is here proposed to validate that usage by elevating *Coxiella* to the status of a full genus, the genotype, of course, remaining the same, i. e., *R. burneti* Derrick, which now becomes *Coxiella burneti* (Derrick).

DEATHS DURING WEEK ENDED DEC. 13, 1947

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Dec. 13, 1947	Corresponding week 1946
Data for 93 large cities of the United States:		
Total deaths	9,942	9,612
Median for 3 prior years	9,612	
Total deaths, first 50 weeks of year	459,534	451,426
Deaths under 1 year of age	697	805
Median for 3 prior years	640	
Deaths under 1 year of age, first 50 weeks of year	36,592	33,425
Data from industrial insurance companies:		
Policies in force	66,993,558	67,314,498
Number of death claims	12,493	12,089
Death claims per 1,000 policies in force, annual rate	9.7	9.4
Death claims per 1,000 policies, first 50 weeks of year, annual rate	9.2	9.4

---

[1] From the Rocky Mountain Laboratory, Hamilton, Mont., Division of Infectious Diseases, National Institute of Health.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease withou knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED DECEMBER 20, 1947

Summary

A decline occurred during the current week in the incidence of influenza from 3,973 to 3,684 cases, as compared with 3,338 for the corresponding week last year, which was also the 5-year median. The only States reporting more than 195 cases, are Virginia, 473 (last week 721), South Carolina, 638 (last week 542), and Texas, 1,498 (last week 1,639). Slight increases occurred in 4 other States—West Virginia (79 to 194), Alabama (58 to 148), Arkansas (89 to 195), and Arizona (81 to 101). No other State reported more than 50 cases except Oklahoma (93, last week 117) and California 55 (last week 99). Of the total of 32,861 cases reported since July 26 (approximate average date of seasonal low incidence), (as compared with 30,315 for the 5-year median, 30,315 and 309,301 respectively, for the same periods of 1946 and 1945), 25,706 cases, or 78 percent, occurred in Virginia, South Carolina, and Texas, which same 3 States last year reported 80 percent of the total for the period.

A total of 54 cases of poliomyelitis was reported (last week 108, 5-year median 89). The largest numbers occurred in California (8), New York (6), North Carolina (5), and Idaho (4)—all showing decreases. The total since March 15 (average seasonal low incidence date) is 10,126, as compared with 24,631 for the same period last year and a 5-year median of 13,251.

During the week, 5 cases of smallpox occurred, 2 in Kansas and 1 each in Missouri, Nebraska, and North Carolina; 2 cases of anthrax, 1 each in Massachusetts and Pennsylvania; and 1 case of Rocky Mountain spotted fever, in North Carolina.

In 89 large cities of the United States a total of 9,384 deaths was recorded during the week, as compared with 9,708 last week, 9,133 and 10,214, respectively, for the corresponding weeks of 1946 and 1945, and a 3-year (1944–46) median of 9,135. The total to date for the same cities is 456,818, as compared with 448,770 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Dec. 20, 1947, and comparison with corresponding week of 1946 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46
	Dec. 20, 1947	Dec. 21, 1946		Dec. 20, 1947	Dec. 21, 1946		Dec. 20, 1947	Dec. 21, 1946		Dec. 20, 1947	Dec. 21, 1946	
NEW ENGLAND												
Maine	0	8	1	-------	-------	-------	4	217	13	0	1	1
New Hampshire	0	0	0	2	-------	-------	2	1	2	0	1	0
Vermont	0	0	0	-------	-------	-------	-------	207	4	0	0	0
Massachusetts	7	25	5	-------	-------	-------	108	125	125	0	0	4
Rhode Island	0	1	0	-------	1	7	1	16	10	0	0	0
Connecticut	0	0	1	3	5	5	15	141	13	0	0	2
MIDDLE ATLANTIC												
New York	19	24	14	[1] 6	[1] 6	[1] 10	361	175	243	5	4	12
New Jersey	7	9	6	8	3	12	154	80	38	0	1	4
Pennsylvania	6	26	10	(2)	[3] 5	[3] 5	206	644	455	4	4	6
EAST NORTH CENTRAL												
Ohio	27	4	10	6	4	7	234	138	46	2	2	3
Indiana	8	7	7	14	5	9	36	5	16	0	1	4
Illinois	3	1	4	4	5	7	528	17	46	3	2	9
Michigan [3]	2	2	11	22	2	4	614	8	45	3	2	5
Wisconsin	1	0	3	3	31	31	100	58	58	2	3	3
WEST NORTH CENTRAL												
Minnesota	4	8	7	-------	-------	-------	338	3	3	1	0	2
Iowa	4	3	3	-------	-------	-------	126	7	20	0	0	0
Missouri	11	6	6	10	3	3	4	5	6	3	0	1
North Dakota	4	0	2	-------	-------	24	170	1	1	0	0	0
South Dakota	1	1	1	-------	-------	-------	3	1	4	0	0	0
Nebraska	0	0	0	21	-------	11	3	1	3	1	0	0
Kansas	2	14	8	3	1	7	8	3	25	0	0	1
SOUTH ATLANTIC												
Delaware	0	2	0	-------	-------	-------	2	-------	-------	0	0	0
Maryland [3]	6	14	10	3	2	11	1	24	12	0	0	8
District of Columbia	0	1	0	-------	1	3	18	17	2	0	0	1
Virginia	14	13	12	473	525	525	62	92	40	0	3	6
West Virginia	5	2	3	194	89	89	232	160	14	2	3	3
North Carolina	15	4	6	-------	-------	2	4	87	31	5	0	1
South Carolina	6	6	7	638	510	510	3	24	24	0	3	1
Georgia	7	14	8	13	15	71	25	14	13	1	0	2
Florida	4	1	6	12	-------	1	15	34	6	1	1	1
EAST SOUTH CENTRAL												
Kentucky	5	12	3	3	4	18	5	52	52	2	5	4
Tennessee	3	10	10	50	25	56	19	4	7	2	2	4
Alabama	8	8	8	148	51	143	1	14	3	0	2	2
Mississippi [3]	4	12	8	9	-------	-------	2	-------	-------	0	1	1
WEST SOUTH CENTRAL												
Arkansas	11	4	6	195	58	71	23	10	10	0	0	0
Louisiana	4	2	9	1	4	11	13	6	5	0	1	1
Oklahoma	12	2	6	93	23	94	-------	-------	9	5	0	2
Texas	25	29	29	1,498	1,726	1,726	307	21	44	4	2	4
MOUNTAIN												
Montana	1	0	0	20	19	19	113	48	26	0	1	1
Idaho	1	1	1	3	19	12	6	4	4	0	0	0
Wyoming	0	3	0	-------	-------	15	65	-------	10	0	0	0
Colorado	12	13	8	46	18	34	21	10	10	0	0	2
New Mexico	3	2	2	-------	2	3	2	28	3	0	0	0
Arizona	1	1	1	101	163	163	4	77	8	0	0	0
Utah [3]	18	0	0	2	1	43	7	2	14	0	0	1
Nevada	0	0	0	-------	-------	-------	-------	-------	-------	0	0	0
PACIFIC												
Washington	4	1	2	-------	-------	4	63	25	40	1	1	3
Oregon	3	5	2	25	4	18	4	31	31	0	0	1
California	12	18	20	55	8	30	231	59	87	8	3	11
Total	290	319	319	3,684	3,338	3,338	4,263	2,696	2,696	55	49	127
51 weeks	12,267	15,893	15,236	334,374	220,512	294,167	211,626	660,721	594,435	3,362	5,584	7,837
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	5,970	7,265	8,079	32,861	30,315	30,315	26,124	20,636	23,401	721	918	1,342

[1] New York City only.

[2] Philadelphia only.

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended Dec. 20, 1947, and comparison with corresponding week of 1946 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46
	Dec. 20, 1947	Dec. 21, 1946		Dec. 20, 1947	Dec. 21, 1946		Dec. 20, 1947	Dec. 21, 1946		Dec. 20, 1947 [5]	Dec. 21, 1946	
NEW ENGLAND												
Maine	0	1	0	14	34	30	0	0	0	0	0	0
New Hampshire	0	1	0	0	4	4	0	0	0	0	0	0
Vermont	0	0	0	0	11	4	0	0	0	0	0	0
Massachusetts	1	1	3	83	124	210	0	0	0	1	2	1
Rhode Island	1	1	0	9	20	10	0	0	0	1	0	0
Connecticut	0	2	0	27	18	28	0	0	0	1	0	0
MIDDLE ATLANTIC												
New York	6	11	11	155	249	265	0	0	0	0	3	3
New Jersey	2	0	0	36	79	79	0	0	0	1	2	1
Pennsylvania	2	2	1	125	101	157	0	0	0	8	3	2
EAST NORTH CENTRAL												
Ohio	0	5	1	207	232	232	0	0	1	0	1	1
Indiana	2	1	0	61	37	60	0	0	0	1	0	0
Illinois	3	7	2	99	121	135	0	0	1	1	1	1
Michigan [3]	2	11	2	60	137	137	0	0	0	0	2	1
Wisconsin	1	3	2	52	54	122	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	1	2	2	40	27	56	0	0	0	0	0	0
Iowa	0	4	1	61	33	42	0	1	0	1	0	0
Missouri	0	13	1	24	28	46	1	1	0	1	1	1
North Dakota	0	2	1	6	2	12	0	0	0	0	0	0
South Dakota	0	1	0	3	3	13	0	0	0	0	0	0
Nebraska	3	1	0	21	15	25	1	0	0	0	0	0
Kansas	0	4	0	28	25	56	2	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	4	6	4	0	0	0	0	0	0
Maryland [3]	0	0	0	19	15	40	0	0	0	0	1	1
District of Columbia	0	1	0	8	4	12	0	0	0	0	2	0
Virginia	0	2	1	25	60	60	0	0	0	2	3	3
West Virginia	1	0	0	39	56	38	0	0	0	0	0	0
North Carolina	5	6	1	28	24	39	1	0	0	1	0	0
South Carolina	0	0	0	4	3	7	0	0	0	0	0	1
Georgia	0	1	0	23	17	17	0	0	0	0	0	0
Florida	0	0	0	6	1	5	0	0	0	7	0	3
EAST SOUTH CENTRAL												
Kentucky	1	1	1	34	50	32	0	0	0	3	1	1
Tennessee	0	0	0	29	27	38	0	0	0	2	2	1
Alabama	0	0	0	9	25	21	0	0	0	0	2	1
Mississippi [3]	1	4	2	5	5	10	0	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas	2	3	1	3	5	5	0	0	0	0	1	1
Louisiana	1	3	1	2	9	9	0	0	0	0	0	0
Oklahoma	0	9	1	20	1	30	0	0	0	1	0	1
Texas	1	5	5	28	41	41	0	0	0	5	6	5
MOUNTAIN												
Montana	0	0	0	10	6	12	0	0	0	0	0	0
Idaho	4	1	0	10	6	6	0	0	0	1	4	0
Wyoming	0	0	0	3	6	6	0	0	0	0	0	0
Colorado	1	0	0	53	35	36	0	0	0	2	0	1
New Mexico	1	2	0	5	16	16	0	0	0	1	0	1
Arizona	0	0	1	9	8	8	0	0	0	2	4	0
Utah [3]	0	2	2	19	27	54	0	0	0	0	0	0
Nevada	0	1	0	0	1	1	0	0	0	0	0	0
PACIFIC												
Washington	1	3	2	59	27	27	0	0	0	0	0	0
Oregon	3	2	2	13	26	37	0	0	0	0	0	1
California	8	19	10	119	95	196	0	0	0	4	0	1
Total	54	138	89	1,697	1,956	2,527	5	2	6	47	41	42
51 weeks	10,738	25,098	13,648	81,632	111,108	137,454	168	332	385	3,849	3,966	5,349
Seasonal low week [4]	(11th) Mar. 15–21			(32d) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	10,126	24,631	13,251	19,529	24,813	36,360	21	53	78	3,364	3,491	4,533

---

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year

[5] Including paratyphoid fever reported separately as follows: Rhode Island 1; Pennsylvania 1; Virginia 1; North Carolina 1; Florida 1; Kentucky 2; Tennessee 1.

Telegraphic morbidity reports from State health officers for the week ended Dec. 20, 1947, and comparison with corresponding week of 1946 and 5-year median—Con.

Division and State	Whooping cough			Week ended Dec. 20, 1947							
	Week ended—		Median 1942-46	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Dec. 20, 1947	Dec. 21, 1946		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	14	18	39								1
New Hampshire	1										
Vermont	25	25	19								2
Massachusetts	134	166	126		2						2
Rhode Island	20	28	24								
Connecticut	95	36	36								
MIDDLE ATLANTIC											
New York	148	226	202	6						1	5
New Jersey	95	144	106	2					1		
Pennsylvania	136	177	93						1		
EAST NORTH CENTRAL											
Ohio	80	83	83						1		2
Indiana	29	26	23		1				2		1
Illinois	52	105	54	3					2		8
Michigan [3]	88	201	119	6							6
Wisconsin	117	143	94								9
WEST NORTH CENTRAL											
Minnesota	83	9	12			1					5
Iowa	13	14	14								16
Missouri	26	13	9						4		
North Dakota	15	1	7	3			1				
South Dakota	2		1								2
Nebraska	12	5	5								10
Kansas	23	24	24								1
SOUTH ATLANTIC											
Delaware	3	4	2								
Maryland [3]	48	54	53			1	1		1		4
District of Columbia	9	4	6						1		
Virginia	77	84	59			25	1		4		1
West Virginia	29	10	10								
North Carolina	89	50	48	1				1			2
South Carolina	74	27	27		1				1		2
Georgia	20	10	6		1					1	1
Florida	7	2	5	2							2
EAST SOUTH CENTRAL											
Kentucky	20	52	19						1		
Tennessee	68	6	8	1					3	2	1
Alabama	37	5	12							1	1
Mississippi [3]	5			5	1				1		1
WEST SOUTH CENTRAL											
Arkansas	40	15	15	4							1
Louisiana	2	7	1	2					2	2	1
Oklahoma	11	17	8		1						2
Texas	146	170	147	29	282	102				4	6
MOUNTAIN											
Montana	4	5	6	1							
Idaho	31	1	1								
Wyoming	12	8	6								
Colorado	78	10	16								5
New Mexico	7	10	8								
Arizona	16	55	9			19					
Utah [3]	4	1	8				2				4
Nevada		1									
PACIFIC											
Washington	33	23	23								1
Oregon	14	6	8								
California	114	65	90	3	7						4
Total	2,206	2,146	1,541	68	296	148	5	1	25	11	109
Same week, 1946	2,146			44	416	54	9	2	62	33	93
Median, 1942-46	1,541			32	406	54	5	1	28	77	[6] 65
51 weeks: 1947	151,988			2,984	16,468	9,575	622	568	1,327	1,895	6,014
1946	98,565			2,394	16,423	6,351	609	571	1,114	3,327	5,254
Median, 1942-46	122,344			1,917	17,968	7,387	615	454	789	4,475	[6] 5,012

[3] Period ended earlier than Saturday.

[6] 2-year average, 1945-46.

Anthrax: Massachusetts 1, Pennsylvania 1.

Alaska: Chickenpox 5, measles 1.

Territory of Hawaii: Diphtheria 1, bacillary dysentery 1, measles 5, endemic typhus fever 1, whooping cough 38.

WEEKLY REPORTS FROM CITIES*

City reports for week ended Dec. 13, 1947

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	1	0	------	0	1	0	2	0	0	13
New Hampshire:												
Concord	0	0	------	0	------	0	1	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	1	0	0	0	0	------
Massachusetts:												
Boston	8	0	------	1	36	0	11	0	24	0	1	16
Fall River	0	0	------	0	------	0	1	0	0	0	0	7
Springfield	0	0	------	0	1	0	0	0	7	0	0	9
Worcester	0	0	------	0	1	0	9	0	2	0	0	8
Rhode Island:												
Providence	0	0	------	0	0	0	8	0	2	0	0	17
Connecticut:												
Bridgeport	0	0	------	0	3	0	0	0	1	0	0	------
Hartford	0	0	------	0	------	0	0	0	4	0	0	11
New Haven	0	0	------	0	------	0	2	0	4	0	0	7
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0	------	0	1	0	4	0	2	0	0	11
New York	10	0	9	3	136	2	67	2	50	0	1	52
Rochester	0	0	------	0	------	0	4	0	9	0	0	17
Syracuse	0	0	------	0	------	0	1	0	3	0	1	23
New Jersey:												
Camden	1	0	------	0	------	0	1	0	0	0	0	------
Newark	0	0	------	0	5	0	5	0	10	0	1	8
Trenton	5	0	------	0	------	0	3	0	0	0	0	------
Pennsylvania:												
Philadelphia	1	0	3	0	16	3	25	0	38	0	1	47
Pittsburgh	0	0	1	1	------	0	12	0	10	0	0	13
Reading	0	0	------	0	2	0	1	0	2	0	0	8
EAST NORTH CENTRAL												
Ohio:												
Cleveland	0	0	1	0	2	1	4	0	16	0	0	27
Columbus	5	0	1	1	22	1	3	0	12	0	0	7
Indiana:												
Fort Wayne	0	0	------	0	2	0	1	1	7	0	0	1
Indianapolis	2	1	------	0	1	1	5	0	5	0	0	4
South Bend	0	0	------	0	1	0	0	0	1	0	0	1
Terre Haute	0	0	------	0	1	0	2	0	0	0	0	------
Illinois:												
Chicago	0	0	1	1	156	3	33	1	83	0	0	21
Michigan:												
Detroit	0	0	------	1	3	0	10	0	31	0	0	48
Flint	0	0	------	0	1	0	0	4	1	0	0	0
Grand Rapids	0	0	------	0	53	0	0	0	1	0	0	9
Wisconsin:												
Kenosha	0	0	------	0	3	0	0	0	0	0	0	------
Milwaukee	0	0	1	1	5	1	2	0	8	0	0	16
Racine	0	0	------	0	1	0	1	0	1	0	0	3
Superior	0	0	------	0	------	0	0	0	2	0	0	5
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	6	0	2	0	3	0	0	17
Minneapolis	2	0	1	0	196	0	3	0	33	0	0	20
St. Paul	0	0	------	0	2	0	4	1	4	0	0	26
Missouri:												
Kansas City	0	0	9	0	------	0	3	1	3	0	0	23
St. Joseph	0	0	1	0	------	0	0	0	1	0	0	------
St. Louis	2	0	1	0	4	0	10	0	3	0	0	3

*In some instances the figures include nonresident cases

City reports for week ended Dec. 13, 1947—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	0	-------	0	4	0	1	0	0	3
Kansas:												
Topeka	0	0	------	0	1	0	0	0	0	0	0	------
Wichita	0	0	------	0	-------	0	5	0	3	0	0	------
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	0	2	0	2	0	0	1
Maryland:												
Baltimore	3	0	3	0	1	0	7	0	9	0	1	32
Cumberland	4	0	------	0	-------	0	0	0	0	0	0	------
Frederick	0	0	------	0	-------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	1	0	12	0	12	0	3	0	0	13
Virginia:												
Lynchburg	0	0	------	0	-------	0	0	0	3	0	0	------
Richmond	0	0	------	0	1	0	1	0	5	0	0	4
Roanoke	0	0	------	0	-------	0	0	0	1	0	0	------
West Virginia:												
Charleston	0	0	------	0	-------	0	0	0	1	0	1	------
Wheeling	0	0	------	0	-------	0	0	0	0	0	0	------
North Carolina:												
Raleigh	0	0	------	0	-------	0	0	0	0	0	0	2
Wilmington	2	0	------	0	-------	0	1	0	0	0	0	------
Winston-Salem	0	0	------	0	-------	0	0	0	2	0	0	2
South Carolina:												
Charleston	1	0	34	0	-------	0	2	0	1	0	0	4
Georgia:												
Atlanta	0	0	3	2	-------	0	3	0	1	0	0	------
Brunswick	0	0	------	0	-------	0	0	0	0	0	0	------
Savannah	0	0	1	1	1	0	3	0	1	0	0	1
Florida:												
Tampa	0	0	------	0	3	1	0	0	3	0	0	------
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	2	0	6	0	5	0	5	0	1	9
Nashville	0	0	------	0	-------	0	2	0	2	0	0	1
Alabama:												
Birmingham	2	0	------	0	-------	0	5	0	1	0	0	1
Mobile	1	0	15	1	-------	0	3	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	1	0	-------	0	0	0	1	0	0	1
Louisiana:												
New Orleans	1	0	1	1	1	0	9	0	6	0	1	------
Shreveport	1	0	------	0	-------	0	8	0	0	0	0	------
Oklahoma:												
Oklahoma City	0		1	0	-------	0	2	0	0	0	0	1
Texas:												
Dallas	1	0	2	2	-------	0	2	0	4	0	0	2
Galveston	0	0	------	0	-------	0	1	0	1	0	0	------
Houston	1	0	------	0	2	0	2	1	0	0	0	1
San Antonio	1	0	1	1	-------	0	4	0	0	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	48	0	0	0	0	0	0	------
Great Falls	0	0	------	0	3	0	0	0	0	0	0	1
Helena	1	0	------	0	3	0	0	0	2	0	0	------
Missoula	0		------	0	-------	0	0	0	0	0	0	------
Idaho:												
Boise	0	0	------	0	-------	0	1	0	3	0	0	------
Colorado:												
Denver	3	0	1	0	14	1	7	0	11	0	0	15
Pueblo	1	0	------	0	-------	0	1	0	3	0	0	37
Utah:												
Salt Lake City	0	0	------	0	4	0	0	1	1	0	0	------

City reports for week ended Dec. 13, 1947—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	1	0	3	1	5	0	0	11
Spokane	0	0	1	0	1	0	1	0	9	0	0	3
Tacoma	0	0	------	0	3	0	0	0	2	0	0	3
California:												
Los Angeles	1	0	6	0	12	1	0	0	22	0	0	10
Sacramento	0	0	------	0	------	0	0	0	1	0	0	------
San Francisco	1	0	------	0	142	1	4	1	6	0	1	13
Total	63	1	103	17	919	16	340	14	456	0	10	669
Corresponding week, 1946[1]	96	------	57	20	681	------	285	------	541	0	7	793
Average 1942–46[1]	80	------	1,179	[2] 39	[3] 800	------	[2] 370	------	779	0	10	583

[1] Exclusive of Oklahoma City. [2] 3-year average, 1944–1946. [3] 5-year median, 1942–46.

Anthrax.—Cases: Boston 1; New York 1.
Dysentery, amebic.—Cases: New York 14; Chicago 1; Flint 1; St. Louis 2; New Orleans 1; Los Angeles 3.
Dysentery, bacillary.—Cases: Portland, 2; New York 6; Chicago 6.
Dysentery, unspecified.—Cases: Baltimore 1; Dallas 1; San Antonio 1.
Typhus fever, endemic.—Cases: Richmond 1; Little Rock 1; New Orleans 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (latest available estimated population, 34,061,700)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	20.9	0.0	2.6	2.6	107	0.0	88.9	0.0	120	0.0	2.6	230
Middle Atlantic	8.3	0.0	6.0	1.9	74	2.3	56.9	0.9	57	0.0	1.9	83
East North Central	4.5	0.6	2.6	2.6	163	4.5	39.6	3.9	77	0.0	0.0	92
West North Central	8.0	0.0	24.1	0.0	420	0.0	62.3	4.0	103	0.0	0.0	185
South Atlantic	16.3	0.0	68.6	4.9	29	1.6	50.7	0.0	52	0.0	3.3	96
East South Central	23.6	0.0	100.3	5.9	85	0.0	88.5	0.0	47	0.0	5.9	65
West South Central	12.7	0.0	15.2	10.2	8	0.0	71.1	2.5	30	0.0	2.5	13
Mountain	39.7	0.0	7.9	0.0	572	7.9	71.5	7.9	159	0.0	0.0	421
Pacific	3.2	0.0	11.1	0.0	251	3.2	12.7	3.2	71	0.0	1.6	63
Total	9.7	0.2	15.8	2.6	141	2.5	52.2	2.1	70	0.0	1.5	103

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended November 29, 1947.—During the week ended November 29, 1947, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		63	1	211	386	57	69	61	160	1,008
Diphtheria		1		16	9	1	2	18		47
Dysentery:										
Amebic					1					1
Bacillary				2						2
Encephalitis						3				3
German measles				3	12	1	2	8	5	31
Influenza		33			6	2			10	51
Measles		3		16	211	120	6	7	44	407
Meningitis, meningococcus					2			1		3
Mumps		29	1	164	604	47	22	29	47	943
Poliomyelitis		5		2	3	3	3	3	2	21
Scarlet fever		6	7	63	73	9	1	9	12	180
Tuberculosis (all forms)		1	8	124	24	25	13	44	46	285
Typhoid and paratyphoid fever				5	6		1		1	13
Undulant fever				2						2
Venereal diseases:										
Gonorrhea	4	17	15	98	101	34	28	45	118	460
Syphilis	3	6	3	55	54	11	14	10	38	194
Other forms									1	1
Whooping cough				74	69	39	9	28	48	267

JAMAICA

Notifiable diseases—4 weeks ended November 29, 1947.—During the 4 weeks ended November 29, 1947, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	1		Poliomyelitis	2	
Chickenpox		9	Puerperal sepsis		1
Diphtheria		2	Tuberculosis	40	62
Dysentery, unspecified	2	1	Typhoid fever	11	131
Erysipelas		1	Typhus fever (murine)	2	2

REPORTS OF CHOLERA PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

Syria.—Information dated December 22, 1947, states that 7 cases of cholera have been reported in the Province of Hauran, south of Damascus, in the villages of Mhagge and Kenye. Information dated December 23, reports 3 additional cases during the preceding twenty-four hours; on December 24, 3 fatal cases were reported.

Plague

Belgian Congo—Costermansville and Stanleyville Provinces.—During the week ended December 5, 1947, 1 fatal case of plague was reported in Costermansville Province, and during the week ended December 12, 1947, 1 fatal case was reported in Stanleyville Province.

Smallpox

Ecuador.—For the month of November 1947, 650 cases of smallpox with 3 deaths were reported in Ecuador, including 175 cases in El Oro Province.

Paraguay.—For the month of November 1947, 142 cases of smallpox (alastrim) were reported in Paraguay.

X

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948

For sale by the Superintendent of Documents, United States Government Printing Office Washington 25, D. C.

Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 JANUARY 16, 1948 NUMBER 3

IN THIS ISSUE

Chronic Disease Incidence

Public Health Service Publications

1798

CONTENTS

Page

An estimate of the incidence of chronic disease. P. S. Lawrence 69
Public Health Service publications. A list of publications issued during the period January–June 1947 83
Deaths during week ended December 20, 1947 87

INCIDENCE OF DISEASE

United States:

Reports from States for week ended December 27, 1947, and comparison with former years 88

Weekly report from cities:

City reports for week ended December 20, 1947 92
Rates, by geographic divisions, for a group of selected cities 94

Foreign reports:

Canada—Provinces—Communicable diseases—Week ended December 6, 1947 95
United States-Mexican border—Cerebrospinal meningitis outbreak 95

Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—

Cholera 96
Smallpox 96

Public Health Reports

Vol. 63 • JANUARY 16, 1948 • *No. 3*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

AN ESTIMATE OF THE INCIDENCE OF CHRONIC DISEASE

By P. S. LAWRENCE, *Chief of Familial Studies, Division of Public Health Methods, Hagerstown, Maryland, United States Public Health Service*

During the period from 1921 to 1924, the United States Public Health Service conducted a sickness survey among 1,822 white families in Hagerstown, Md. A resurvey of these families was conducted in 1943. The first report (*1*) of this investigation showed the relation between chronic sickness among individuals in the original survey and their survivorship in 1943. In the resurvey, data were obtained not only on mortality, but also on the record of sicknesses among the survivors. In the present report, data are presented on the mortality and morbidity from chronic diseases among those persons who were subjectively free of chronic illness in 1923.

Several surveys have been made to estimate the prevalence or volume of chronic disease as of a given date. Each of these, chief among which was the National Health Survey, (*2*) has shown the great magnitude of the chronic disease problem and the increasing need for private and public health planning to cope with these ailments. Because of the long duration of many of the chronic impairments, the prevalence rates which are available are incapable of giving anything but the roughest estimates as to the age specific incidence or rate of appearance of new cases of chronic diseases within a given period of time. Nor could this incidence be calculated if such diseases were officially reportable, for in all probability only a small proportion of them would be recorded. Yet a knowledge of the incidence of chronic diseases by ages would be of value for the following purposes:

1. Estimating the future costs of a medical care program, whether it be indigent medical care, industrial health fund, or hospitalization or medical care insurance.
2. Reaching decisions concerning individual endowment insurance and determining group programs of retirement and retirement funds.
3. Estimating future needs for medical personnel and equipment in private and public chronic disease institutions, which is of particular importance in view of the constantly increasing proportion of people in the older age groups.

The present material is neither extensive enough nor refined enough for detailed application to the above purposes. However, in view of the lack of more specific knowledge, it is believed justifiable to approximate from it a measure of the incidence of chronic illness by age.

MATERIAL

The original family survey was made by trained workers. All classes of the population were covered by the sections selected for the study. At the time of the first visit information as to socio-economic and sanitary factors in the household was obtained. Thereafter home visits were made at intervals of less than 2 months to obtain information about illnesses which had occurred during that period. The detailed techniques of this survey have been reported by Sydenstricker (*3*). He states that the records obtained were of attacks, rather than illness in the sense of ill health, and that of the persons affected with some chronic condition only those who suffered ill-effects from this condition during the interval between visits were recorded as having a chronic ailment. The present study includes only those persons who were members of families visited periodically for 12 months or longer and who had no history of an attack of a chronic disease during the entire period of observation. Of the 5,027 individuals thus obtained, who were either dead or of known state of health in 1943, 83 percent had been originally observed for 26 months or longer, 11 percent for 18 to 26 months, and less than 7 percent for 12 to 18 months. Since these persons had given no evidence of subjective symptoms of chronic illness for a period in excess of 12 months, they may be considered, as a group, free of chronic impairment at the end of the original survey.

The method followed in the resurvey conducted in 1943 has been described in the first report. In locating the original families and persons, use was made of family records in the Hagerstown office of the United States Public Health Service, records of the Washington County Health Department, directories, and records of official and quasi-official organizations. When living members of a family were traced, home visits were made to obtain the information desired. The responses concerning chronic ailments of living persons were given, of course, in the language, and according to the knowledge, of the respondent.

Table 1 presents the age distribution among persons who had no complaint in 1921–24 and who were dead, chronically ill, or had no illness in 1943. The cause of death or illness, where known, was classified as a chronic disease on the basis of the nature of the disease in the same manner as in the 1921–24 survey. Among these causes are the following broad groupings by disease or organs involved: Neuritis, sciatica, neuralgia; insanity, mental disorders; paralysis;

cerebral hemorrhage, apoplexy; epilepsy; diseases of eyes and ears; rheumatism, chronic arthritis; upper respiratory (chronic sinusitis, rhinitis, bronchitis); asthma, hay fever; lower respiratory (tuberculosis, chronic pleurisy); stomach and intestines (ulcers, hernia); liver and other digestive; diabetes; kidneys; bladder and other genitourinary; vascular (arteriosclerosis, thrombosis, etc.); heart (myocarditis, endocarditis, valvular diseases, etc.); cancer.

TABLE 1.—*Age distribution of persons who were well in 1923 and who, by 1943 had died, had a chronic illness, or were still well*

Age in 1923	Well in 1923	Dead by 1943				Ill in 1943				Well in 1943
		Acute disease or violence	Unknown cause	Chronic disease	Total dead	Known chronic disease	Chronic illness of ill-defined or unstated cause	Major permanent impairment	Total ill	
Under 5	670	23	0	1	24	30	26	4	60	586
5-9	663	19	3	10	32	32	26	4	62	569
10-14	570	8	3	17	28	31	22	1	54	488
15-19	474	11	5	18	34	35	20	6	61	379
20-24	402	12	2	11	25	37	13	3	53	324
25-29	406	19	5	31	55	29	26	3	58	293
30-34	381	18	2	32	52	38	26	7	71	258
35-39	318	7	13	48	68	33	28	2	63	187
40-44	303	16	4	55	75	49	21	4	74	154
45-49	256	5	5	73	83	40	16	4	60	113
50-54	188	12	9	87	108	22	14	1	37	43
55-59	138	4	7	79	90	14	5	1	20	28
60-64	108	3	4	78	85	3	5	1	9	14
65-69	77	4	2	63	69	1	4	0	5	3
70-74	51	3	2	44	49	0	1	0	1	1
75 over	22	0	1	20	21	0	1	0	1	0
All ages	5,027	164	67	667	898	394	254	41	689	3,440

Included among the major permanent impairments are the following: Spinal injuries; disability from broken knees and hips; lost leg or arm; crippled (specified and unspecified); after effects of poisoning, burns, or acute diseases.

Minor orthopedic impairments and complaints of temporary conditions due to menopause are excluded from the present study.

It is evident that the accuracy of diseases and illnesses reported in table 1 is unsatisfactory from the standpoint of diagnosis of disease by physical examination. But for this study it is desired to know how many persons from the original well population complained of some chronic ailment or gross impairment at the expiration of 20 years. It is assumed that the cases above are a reasonably accurate report of this condition among persons who were still alive in 1943.

For persons who died or were interned in Washington County, information as to the date and cause of death was obtained from death certificates. Data on cause of death were also received from relatives during the canvass of homes, and whenever possible were verified by death certificates.

COMPARISON WITH OTHER MATERIAL

The literature contains no information from which comparisons can be made with the chronic disease incidence rates estimated in this report. Yet it is desirable, for the purpose of judging the general applicability of the findings of this sample, to see how certain observations derived from the present population compare with similar observations that are available from other sources. To this end, chronic disease prevalence rates and mortality rates for the Hagerstown material are presented below in conjunction with the corresponding figures from data of wider scope.

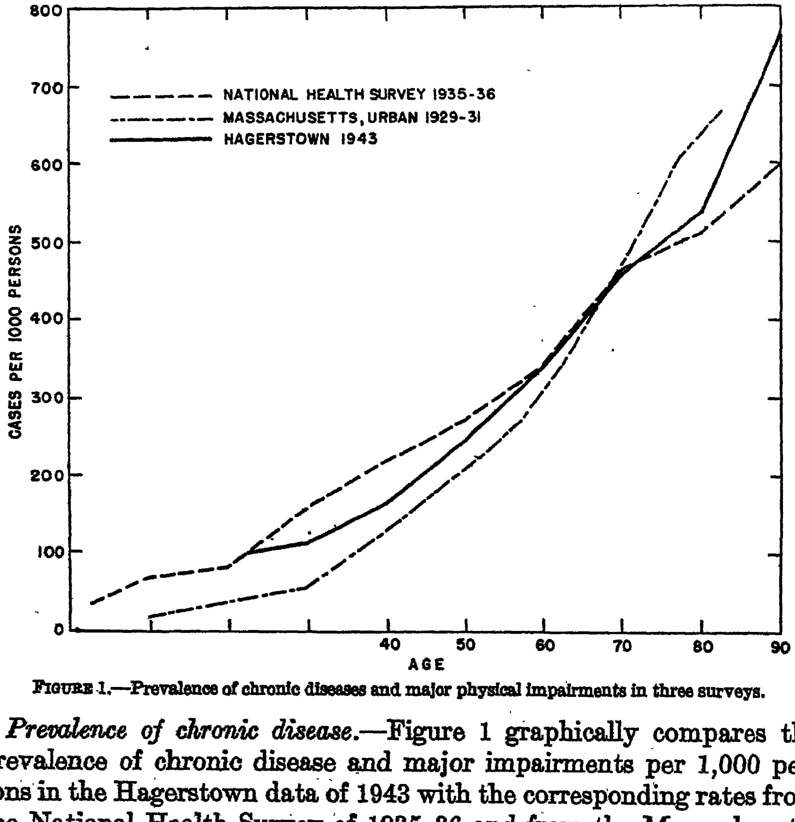


FIGURE 1.—Prevalence of chronic diseases and major physical impairments in three surveys.

Prevalence of chronic disease.—Figure 1 graphically compares the prevalence of chronic disease and major impairments per 1,000 persons in the Hagerstown data of 1943 with the corresponding rates from the National Health Survey of 1935–36 and from the Massachusetts survey of 1929–31 (*4*). Since none of the persons in the Hagerstown resurvey was less than 20 years of age, the curve for Hagerstown contains no readings below this point. In the computation of the present rates, those individuals who had a chronic complaint in 1923 and who were still alive in 1943 were added to the figures of table 1, resulting in a total living population of 5,073 persons. The prevalence curve for the National Health Survey is based upon approximately 2,500,000 urban residents of 18 States. The curve for Massachusetts is from a canvass of about 60,000 residents of 8 cities. Persons with minor orthopedic impairments undoubtedly contribute heavily to the prevalence rates among young adults in the National Health Survey. Such persons, unless they also complained of a chronic disease, were not included among the Hagerstown or Massachusetts cases. The differences in material included probably account for a large part of the deviation between the curves presented.

The National Health Survey prevalence rate for all ages is 177 per 1,000. It has been estimated (*5*) that the rate for chronic disease only is 156. In the Hagerstown data the prevalence rate for persons 20 years of age and over is 212 per 1,000 for both sexes, 242 for females, and 178 for males. This is consistent with other observations as to the higher reported volume of chronic illness among females than among males.

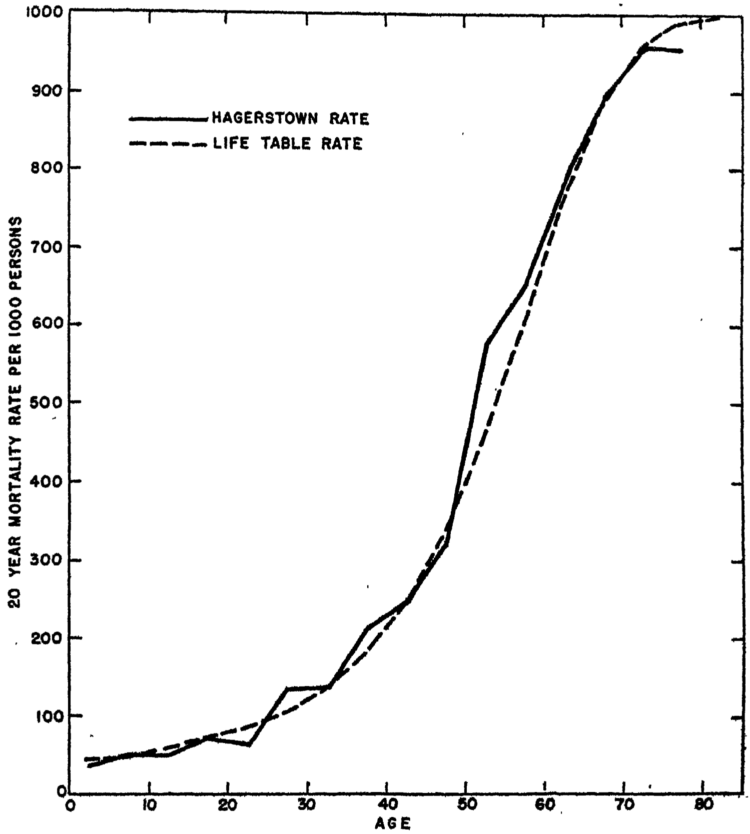


FIGURE 2.—Comparison of 20-year mortality rates for Hagerstown, 1923–43, with the 20-year rates computed from the U. S. life table population based on 1929–31 mortality.

Mortality.—The 5,027 persons who were well in 1923 had a mortality of 178.6 per 1,000 during the 20-year period. This is a little in excess of the rate presented in the first report which did not include in the population or deaths persons who died of unknown cause. In the present study the death rate is 196.2 for 2,686 males and 158.5 for 2,341 females. The mortality rate is higher for males than for females at every decennial age period except from 10 to 19.

It is of interest to compare the 20-year rates of mortality from the present sample with the corresponding rates obtained from life table experiences. The Hagerstown rates were computed from the population and total dead at each age in table 1. These are shown connected by solid lines in figure 2. The life tables for whites of each sex in the United States, 1929–31, were selected for comparison since they represent the mortality experience at approximately the middle of the 20-year span. By combining the male and female life table populations and summing the deaths over 20-year periods, the 20-year mortality rates were approximated at ages 2, 5, 7, etc. These are joined by broken lines in figure 2. Although there are some differences in the composition of the two populations, the mortality of the present sample shows no gross deviation from mortality in general during the period of the years covered.

TWENTY-YEAR INCIDENCE RATES

The population free of chronic disease in 1923 and the number of persons within that population who had died of a chronic disease or who still had a chronic disease in 1943 are presented in table 2 along with the computed morbidity incidence rates for the 20-year period. In this and subsequent tables five decimals are retained, but for arithmetic accuracy all computations were carried to eight decimal places. Column 1, shows ages grouped by 5-year intervals according-

TABLE 2.—*Population, chronic diseases cases, and 20-year incidence rates by quinquennial age groups*

Age in 1923	Population	Ill or dead of chronic disease at x+20	Observed 20-year incidence	Smoothed 20-year incidence
x (1)	P (2)	$_{20}C'_x$ (3)	$_{20}r'_x$ (4)	$_{20}r_x$ (5)
Under 5	647	61	0.09428	0.10889
5–9	641	72	.11232	.11698
10–14	559	71	.12701	.12963
15–19	458	79	.17249	.14927
20–24	388	64	.16495	.17905
25–29	382	89	.23298	.22291
30–34	361	103	.28532	.28477
35–39	298	111	.37248	.36687
40–44	283	129	.45583	.46748
45–49	246	133	.54065	.57937
50–54	167	124	.74251	.69113
55–59	127	99	.77953	.79138
60–64	101	87	.86139	.87313
65–69	71	68	.95775	.93461
70–74	46	45	.97826	.97815
75+	21	21	1.00000	[1] 1.00760

[1] Rejected.

ing to age in 1923. Hence the rates in this table apply to the experience expected at the approximate central ages of the intervals. The population entered in column 2 is composed of those persons who were well in 1923 and known to be dead or of a known condition of health in 1943, as heretofore described, but excludes those individuals who died of acute disease, violence, or unknown cause. Column 3 enumerates all cases of chronic illness and major physical impairment that existed at the end of the 20-year period, and deaths from chronic disease that occurred during the 20-year span. The observed 20-year incidence rates derived from these figures and designated as ${}_{20}r'_x$ are presented in column 4. It should be noted that of the persons still alive in 1943 only those who complained of a chronic disease or major impairment at the end of the 20-year period are included among the cases. The calculation of incidence rates from such figures assumes that none of the persons who claimed to be in good health in 1943 had developed a chronic illness between 1923 and 1943.

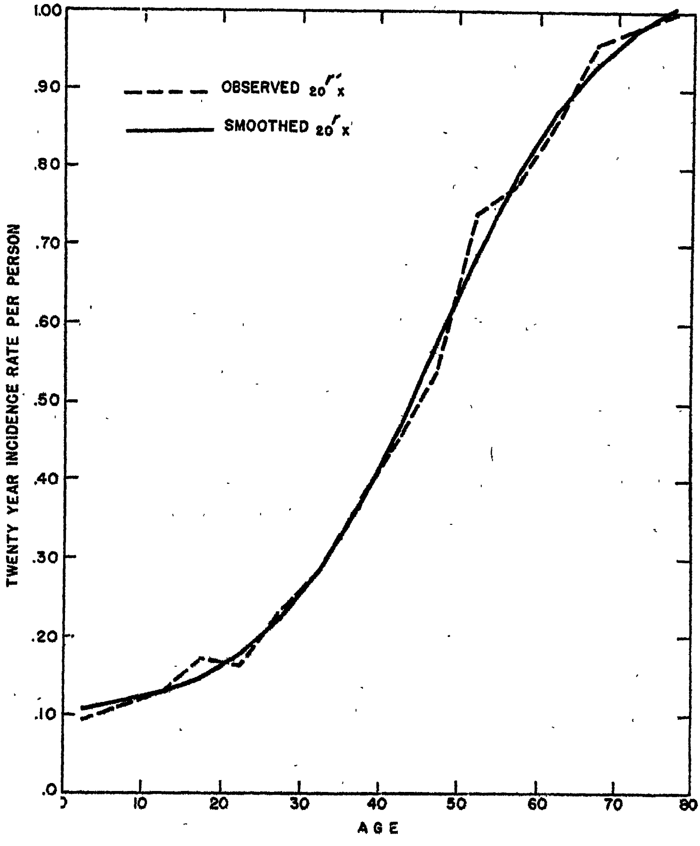


FIGURE 3.—Observed and smoothed 20-year rates of incidence of chronic diseases and major physical impairments.

Information in most cases is not available as to whether individuals who died of acute, violent, or unknown causes had developed a chronic disease prior to death. For this reason these persons do not contribute to the chronic illness column. The exclusion of such persons from the population assumes that if they had survived they would have developed chronic sicknesses during the 20-year period at the same rate as the remainder of the group with which they started. According to the experience of this sample, the ${}_{20}r'_x$ values closely approximate the probability that an individual of age x will develop a chronic disease or major disability before he reaches age x+20. Actually the true rates from the present data would be obtained by including in the population those persons who died of acute, violent, and unknown causes, and including among the ill the cases of chronic illness that occurred in that group prior to death. The ${}_{20}r'_x$ values presented are probably slightly in excess of the rates that would be obtained if it were possible to follow this procedure.

The broken lines of figure 3 connect the observed rates. It will be seen that although there is a certain orderliness of arrangement which is consistent with other experiences with mortality and morbidity, there are fluctuations which are probably due in large measure to chance. To minimize these irregularities a smooth curve was fitted to the observed points and new rates calculated from the equation. The curve selected for fitting was the logistic of the form:

$$y-d=\frac{K}{1+10^{\alpha+\beta x}}$$

The choice of this curve was suggested not only by the form taken by the observed incidence curve, but also by those characteristics of the incidence curve which are consistent with the mathematical features of the logistic. Fitting of the logistic was done according to the method described by Pearl (*6*). Preliminary values of the constants were approximated from a plot on arithlog paper. A second approximation was then made by the least squares method. The equation thus obtained was:

$$y-0.095149=\frac{0.966191}{1+10^{1.840943-0.204773x}}$$

where x is in abscissal units with the first observation at x=0. The 20-year incidence rates derived from this equation and designated as ${}_{20}r_x$ are shown in figure 3 connected by solid lines.

TABLE 3.—*Approximation of 5-year rates of incidence of chronic disease and major physical impairments*

Age	Probability of remaining free of chronic disease from x to x+20	Number free of chronic disease out of 100,000 at age 2.5		Probability of remaining free of chronic disease from x to x+5	Probability of developing a chronic disease from x to x+5
		At 20-year intervals	Computed from interpolation		
x	$_{20}s_x$	w_x	w_x	$_5s_x$	$_5r_x$
(1)	(2)	(3)	(4)	(5)	(6)
2.5	0.89111	100,000	100,000	0.97519	0.02481
7.5	.88303		97,519	.97305	.02695
12.5	.87037		94,891	.97044	.02956
17.5	.85073		92,086	.96769	.03231
22.5	.82095	89,111	89,111	.96635	.03365
27.5	.77709		86,112	.95910	.04090
32.5	.71523		82,590	.94854	.05146
37.5	.63313		78,340	.93383	.06617
42.5	.53252	73,156	73,156	.91472	.08528
47.5	.42063		66,917	.88275	.11725
52.5	.30887		59,071	.83965	.16035
57.5	.20862		49,599	.78544	.21456
62.5	.12687	38,957	38,957	.72254	.27746
67.5	.06539		28,148	.64818	.35182
72.5	.02185		18,245	.56711	.43289
77.5	.00000		10,347	.47763	.52237
82.5		4,942	4,942	.37252	.62748
87.5			1,841	.21673	.78367
92.5			399	.00000	1.00000

APPROXIMATION OF 5-YEAR INCIDENCE RATES

As the incidence of chronic diseases over a 20-year interval is too coarse a measure to be particularly meaningful, it was thought advisable to approximate, from the observed figures, the incidence rates over a shorter period of time. Because of the small size of the sample, the material will be treated by 5-year age groups and 5-year incidence rates. It is apparent that if $_{20}r_x$ is the probability that an individual who is well at a given age will develop a chronic disease or a major impairment within 20 years, then the probability that such an individual will remain free of chronic disease or impairment for 20 years is $1-{}_{20}r_x$. This probability is designated as $_{20}s_x$ in column 2 of table 3.

If one establishes a theoretical population of 100,000 individuals all of whom are free of chronic disease or major impairment at 2½ years of age, at the end of 20 years 89,111 of them would still be free of chronic illness. This is obtained from the relationship:

$$_{20}s_x \cdot w_x = w_{x+20} \tag{1}$$

where w_x is the theoretical population free of disease at age x and w_{x+20} is the population free of disease at age x+20. As shown in column 3 of the table, a continuation of this procedure yields the number of persons out of the original group of 100,000 who would still be well at 20-year intervals, based upon the smoothed experience of the sample. If the well population were known for four successive 5-year intervals of age, it would be possible, by further applications of equation (1) to obtain the well population at 5-year intervals over the entire age range. The desired 5-year incidence rates could then be obtained from the following equations:

$$ {}_5s_x = \frac{w_{x+5}}{w_x} \tag{2} $$

$$ 1 - {}_5s_x = {}_5r_x \tag{3} $$

Following this plan, the task becomes one of approximating four successive w_x values at 5-year intervals, using some method which is logical in the light of our present knowledge of the occurrence of diseases and population changes, and based upon the observed ${}_{20}s_x$ figures. By this it is meant that the w_x figures obtained should, upon the application of equations (2) and (3), yield an ${}_5s_x$ or ${}_5r_x$ curve which has a smooth continuity over the entire age range and which is consistent with the original observations. The values of w_x at 20-year intervals were plotted and a third order parabola was forced to pass through the first four observations. The curve obtained was

$$ y = 100{,}000 - 3187.1667X + 253.5000X^2 - 34.3177X^3 $$

where x is in units corresponding to 5-year age intervals with the first observation at $x=0$. Values of w_x were then interpolated at 5-year intervals between the second and third points to which the curve was fitted. The resulting series of numbers is given below.

Age:	*Well population*
22.5	89, 111
27.5	86, 112
32.5	82, 590
37.5	78, 340
42.5	73, 156

Having obtained approximated values of w_x at 5-year intervals over a 20-year span, it is possible to compute these figures forward to the oldest age and backward to the youngest age by applying equation (1). The completed w_x series is shown in the fourth column of the table. Column 5 gives the 5-year rates of survival free from chronic disease, obtained by the successive divisions indicated in equation (2). The relationship given in equation (3) furnishes the last column of this table. These ${}_5r_x$ rates are the approximate probabilities that an individual, free of chronic disease or major impairment at age x will develop (and may die of), such a disease or impairment during the ensuing 5 years.

The estimation of incidence rates from data on a resurveyed population is new to the study of chronic illness. In view of the experimental nature of the method employed, a consideration of certain features of this method is presented in the appendix.

DISCUSSION

The 5-year incidence rates derived in the preceding section and presented in figure 4 indicate that the rate of occurrence of new cases of chronic diseases and major impairments increases relatively slowly to 35 persons per 1,000 at 25 years of age. At such young ages these rates may be considered as roughly the equivalent of 5 to 7 persons per 1,000 annually. As seen from the graph, the curve increases during the next 20 years to about 100 persons per 1,000 at age 45. From this point on the rate is accelerated. A person fortunate enough to have escaped chronic illness until he is 75 stands about a 50–50 chance of being free of disease or major impairment if he lives to be 80. To view these figures from a different standpoint, out of every 1,000 persons who are well at age 45, approximately 100 of them will require, during the next 5 years, medical attention

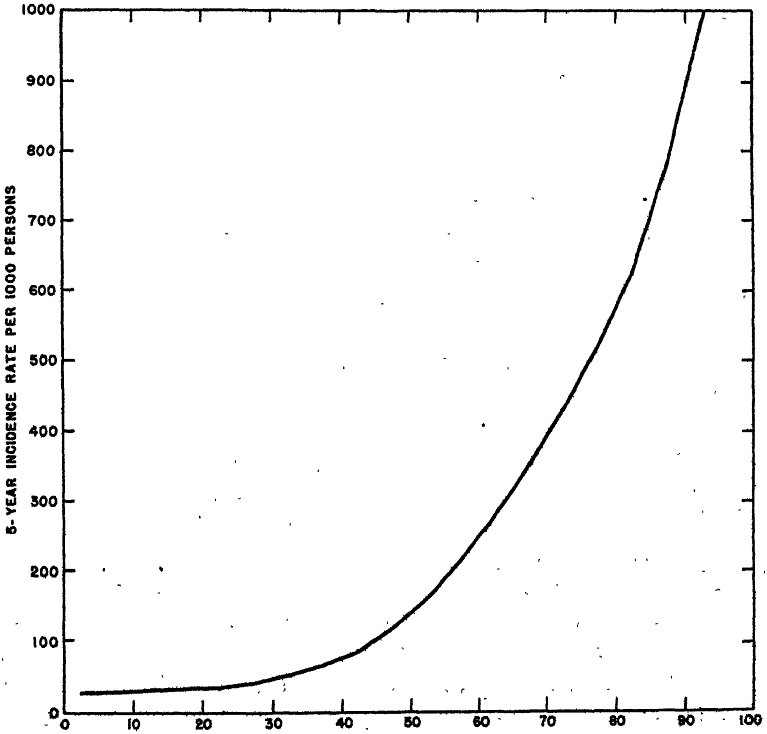


FIGURE 4.—Quinquennial rates of incidence of chronic diseases and major impairments.

for the onset of a chronic disease or a major impairment. Some of these 100 will then require periodic medical treatment, and a few of them almost constant medical care of some nature until they die. Nearly 25 percent of the persons well at 60 will develop within the ensuing 5 years a chronic ailment for which they probably will seek or require medical treatment, and, in many cases, will continue to require care. These increase to about 40 percent at 70, 57 percent at 80, and 90 percent at 90, although with advancing age the absolute number of persons subject to the risk of developing a chronic disease decreases in accordance with the age composition of the population.

The foregoing figures indicate that if the proportion of old people becomes greater without a decrease in the total population, it is highly probable that there will be an increased need for medical services for the care of the chronically ill. This is especially true since the average duration of illness increases progressively with age, as has been pointed out in a comprehensive discussion of population trends (7). It would be of great value to have information on the age incidence of specific chronic diseases, together with the amount and cost of care required for these diseases over a given period of time. Such information, with estimates of the probable age changes in the composition of the population, would be invaluable in planning for alleviation of those economic and social ills associated with chronic disease, and which are extensive geriatric problems.

SUMMARY

1. This report is based upon a resurvey in 1943 of 1,822 white families which originally had been investigated 20 years earlier.

2. The prevalence of chronic disease by ages in the population of 1943 was found to be in general agreement with the volume of chronic illness shown by other data of wider scope. This study is also consistent with other reports as to the greater prevalence of chronic complaints for females than for males.

3. No gross differences exist between the 20-year mortality experience of this sample and the corresponding mortality rates computed from United States life table populations of 1930.

4. Twenty-year rates of incidence of chronic disease and major physical impairments were calculated from a population of 5,027 persons who were well in 1923 and dead or of a known state of health in 1943. A smoothing curve was fitted to these rates. From the smoothed rates and by a method of interpolation, 5-year rates of incidence of chronic disease and major impairments were estimated. These estimates reveal that up to 25 years of age the rate of occurrence of new cases during a 5-year period increases slowly to 35 persons per 1,000. A gradual increase then takes place to about 100 cases per 1,000 at age 45. From this age on the 5-year incidence

increases rapidly to nearly 250 per 1,000 at age 60, 400 at 70 years, 575 at 80 years, and 900 at 90 years.

5. It is suggested that further and more detailed studies on the age incidence of specific chronic diseases would prove valuable for purposes of private and public health planning in geriatrics.

APPENDIX

The principal difficulty in approximating the quinquennial incidence rates was due to a deficiency inherent in the original data. A 20-year period is too long a span for accurate interpolation of intermediate values. On the other hand the data are of such a nature that the 5-year rates may be approximated so as to retain fidelity to the 20-year incidence curve. In other words, the ${}_5r_x$ rates are forced to yield ${}_{20}r_x$ rates which are identical with the observations in the last column of table 2, but due to inaccuracies of interpolation, there may be irregularities within each 20-year span which result in undulations over 20-years periods. In an effort to minimize such irregularities and yet retain a relatively simple technique, several methods and types of curves for interoplation were tried on these and similar data. Most methods were rejected because they led to illogical results in that they failed to yield smooth junctions in the ${}_5s_x$ (or ${}_5r_x$) values at adjacent 20-year periods. The third order parabola proved to be the simplest and the most generally satisfactory over the variety of material upon which the several methods were tried. This equation led to fairly smooth results on the present data, but some other equation, or interpolation over a different age range, might prove more satisfactory for other observations.

TABLE 4.—*Life table quinquennial mortality rates and quinquennial mortality rates approximated from 20-year survivorship*

Age interval	Number dying in interval out of 1,000 alive at beginning of interval		Age interval	Number dying in interval out of 1,000 alive at beginning of interval	
	Life table	Approximated		Life table	Approximated
Under 5	78.47	77.33	55-59	112.47	114.22
5-9	8.81	7.48	60-64	146.70	145.52
10-14	6.73	7.35	65-69	218.09	217.16
15-19	10.94	12.88	70-74	301.85	302.29
20-24	15.04	13.29	75-79	407.57	408.74
25-29	15.93	14.60	80-84	552.64	552.01
30-34	18.10	18.70	85-89	669.18	698.82
35-39	24.52	26.44	90-94	804.24	804.24
40-44	36.18	34.99	95-99	898.28	898.46
45-49	52.06	50.78	100-104	977.13	978.26
50-54	79.99	80.55			

To give an example of the results obtained when this method is employed on other material, the identical procedure was applied to a 5-year abridged life table for white males in Connecticut, 1929–31 (*8*). From the life table population (number of survivors), the 20-year survivorship rates were computed at 5-year intervals of age. The 5-year mortality rates were then approximated as previously described for the estimation of chronic disease incidence rates.

The original quinquennial mortality rates upon which the life table population was based are compared in table 4 with the corresponding rates approximated by the method employed in this paper. It will be seen that the approximated 5-year rates deviate from the original figures in a regular and undulating manner, although the basic pattern of mortality throughout the entire range of ages is preserved. The maximum deviation in any age group is about 2 persons per 1,000. In this example the third order parabola was used for interpolation solely to reproduce identically the method used earlier for chronic diseases. It was apparent, even without comparison with the original mortality rates, that the use of a third order parabola was not the best suited method of interpolation from the life table figures and that the smoothness of the approximated rates could undoubtedly have been improved by the employment of some other equation. From the standpoint of smoothness, better results were obtained in the approximation of the chronic disease incidence rates than in the approximation of 5-year mortality rates from the life table population.

ACKNOWLEDGMENTS

The writer wishes to express his gratitude to Dr. Antonio Ciocco for valuable advice and assistance, and to Mrs. Dorothy Zinkand and Miss Louise Rohrer for their clerical statistical assistance.

REFERENCES

(*1*) Ciocco, A.: Chronic sickness in relation to survivorship twenty years later. Human Biol., vol. 18, No. 1, pp. 33–48 (February) 1946.

(*2*) The National Health Survey: 1935–36. The magnitude of the chronic disease problem in the United States. Preliminary reports. Sickness and medical care series, Bulletin No. 6.

(*3*) Sydenstricker, E.: A study of illness in a general population group. Hagerstown Morbidity Studies, No. 1. The method of study and general results. Pub. Health Rep., **41:** 2069–2088 (1926).

(*4*) Bigelow, G. H., and Lombard, H. F.: Cancer and other chronic diseases in Massachusetts. Boston, Houghton-Mifflin Co. 1933.

(*5*) Britten, R. H., Collins, S. D., and Fitzgerald, J. S.: The national health survey. Some general findings as to disease, accidents, and impairments in urban areas. Pub. Health Rep. **55:** 444–470 (1940).

(*6*) Pearl, R.: Introduction to medical biometry and statistics. Philadelphia, W. B. Saunders Co., 1941.

(*7*) Perrott, G. St. J., and Holland, D. F.: Population trends and problems of public health. Milbank Mem. Fund Quart., vol. XVIII, no. 4 (October) 1940.

(*8*) Reed, L. J., and Merrell, M.: A short method for constructing an abridged life table. Am. J. Hyg., **30:** 33–62 (1939).

PUBLIC HEALTH SERVICE PUBLICATIONS

A List of Publications Issued During the Period January–June 1947

There is given herewith a list of publications of the United States Public Health Service issued during the period January–June 1947.

The purpose of this list is to provide a complete and continuing record of Public Health Service publications, for reference use by librarians, scientific workers, and others interested in particular fields of public health work, and not to offer the publications for indiscriminate free distribution.

Single sample copies are available from the Public Inquiries Section, Office of Health Information, United States Public Health Service, Washington 25, D. C.

Quantities may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at prices shown, with a reduction of 25 percent on lots of 100 copies or more of a single publication.

Those publications marked with an asterisk (*) can be obtained only by purchase.

Periodicals

*Public Health Reports (weekly), January–June, vol. 62, Nos. 1 to 26, pages 1 to 968. 10 cents a number. Subscription price $4 a year.

Extracts from Public Health Reports (monthly), January–June, Tuberculosis Control Issues Nos. 11 to 16, 30 pages each. 10 cents a number. Subscription price $1 a year.

*The Journal of Veneral Disease Information (monthly), January–June, vol. 28, Nos. 1 to 6, pages 1 to 128. 10 cents a number. Subscription price 75 cents a year.

*Journal of the National Cancer Institute (bimonthly), February–June, vol. 7, Nos. 4 to 6, pages 183 to 465. 40 cents a number. Subscription price $2 a year.

Public Health Engineering Abstracts (monthly), January–June, vol. XXVII, Nos. 1 to 6, 32 pages each. No sales stock.

Industrial Hygiene Newsletter (monthly), January–June, vol. 7, Nos. 1 to 6, 16 pages each. 10 cents a number. Subscription price $1 a year.

National Negro Health News (quarterly), January–June, vol. 15, Nos. 1 and 2, 24 pages each. No sales stock.

Reprints From the Public Health Reports

2765. The relation of the National Mental Health Act to State health authorities By Robert H. Felix. January 10, 1947. 9 pages. 5 cents.

2766. The Hospital Survey and Construction Act. Legislation on hospital surveys, construction, and licensing enacted by State legislatures in 1945 and 1946 (as of November 15, 1946). By Vane M. Hoge. January 10, 1947. 18 pages. 10 cents.

2767. The control of rat ectoparasites with DDT. By Russell G. Ludwig and H. Page Nicholson. January 17, 1947. 8 pages; 3 plates. 5 cents.

2768. Observations on the nighttime resting and biting habits of anopheline mosquitoes in DDT-treated and untreated buildings. By Clarance M. Tarzwell and Frank W. Fisk. January 17, 1947. 12 pages. 5 cents.

2769. Comparative studies of DDT dusts, DDT-oil sprays, and paris-green dusts used routinely in anopheline larvae control. By Willis V. Mathis, Frederick F. Ferguson and S. W. Simmons. January 17, 1947. 8 pages. 5 cents.

2770. Services and visits in a children's dental clinic. By Isidore Altman. January 24, 1947. 18 pages. 10 cents.

2771. Public Health Service publications. A list of publications issued during the period January–June 1946. January 24, 1947. 6 pages. 5 cents.

2772. Extended laboratory investigations on the toxicity of DDT residues to adults of *Anopheles quadrimaculatus*. By R. W. Fay, S. W. Simmons and J. M. Clapp. January 31, 1947. 10 pages. 5 cents.

2773. The comparative residual toxicity of DDT to *Anopheles quadrimaculatus* when applied on different surfaces. By J. M. Clapp, R. W. Fay and S. W. Simmons. January 31, 1947. 14 pages. 5 cents.

2774. A comparative study of live and killed vaccines in experimental tuberculosis. By B. J. Olson, Karl Habel and Willard R. Piggott. February 28, 1947. 4 pages. 5 cents.

2775. Control of anopheline mosquito larvae by use of DDT-oil mists. By Frederick F. Ferguson, Earl H. Arnold and William M. Upholt. February 28, 1947. 6 pages. 5 cents.

2776. The inactivation of DDT used in anopheline mosquito larvicides. By William M. Upholt. February 28, 1947. 8 pages. 5 cents.

2777. Isolation of an unidentified spirochete from hen's eggs after inoculation with liver tissue from hens. By Edward A. Steinhaus and Lyndahl E. Hughes. February 28, 1947. 4 pages. 5 cents.

2778. Simplified appraisal of dental-health programs. By John W. Knutson, Cecelia Maday and William A. Jordan. March 21, 1947. 10 pages. 5 cents.

2779. Shadowed replicas of ground sections through teeth. By David B. Scott and Ralph W. G. Wyckoff. March 21, 1947. 12 pages; 8 plates. 10 cents.

2780. The effect of topically applied sodium fluoride on dental caries experience. IV. Report of findings with two, four and six applications. By John W. Knutson, Wallace D. Armstrong and Floyd M. Feldman. March 21, 1947. 6 pages. 5 cents.

2781. Effects of DDT mosquito larviciding on wildlife. Part I. The effects on surface organisms of the routine hand application of DDT larvicides for mosquito control. By Clarence M. Tarzwell. April 11, 1947. 30 pages; 2 plates. 10 cents.

2782. An improved method of producing smallpox vaccine of low bacterial content. By D. H. Ducor. April 18, 1947. 20 pages; 3 plates. 10 cents.

2783. The control of houseflies by DDT sprays. By W. C. Baker, H. I. Scudder and E. L. Guy. April 25, 1947. 18 pages; 2 plates. 10 cents.

2784. The techniques of application and the control of roaches and bedbugs with DDT. By Robert L. Stenburg. May 9, 1947. 13 pages. 5 cents.

2785. A new technique for sampling the density of housefly populations. By H. I. Scudder. May 9, 1947. 7 pages; 1 plate. 10 cents.

2786. Studies of sewage purification. XVII. The utilization of organic substrates by activated sludge. By O. R. Placak and C. C. Ruchhoft. May 16, 1947. 20 pages. 10 cents.

2787. Rickettsialpox—A newly recognized rickettsial disease. V. Recovery of *Rickettsia akari* from a house mouse (*Mus musculus*). By Robert J. Huebner, William L. Jellison and Charles Armstrong. May 30, 1947. 4 pages. 5 cents.

2788. Preliminary studies on the control of blowflies with DDT. By W. C. Baker and L. G. Schwartz. May 30, 1947. 9 pages; 1 plate. 5 cents.
2789. A new Salmonella type isolated from man: *Salmonella texas*. By James Watt, Thelma M. DeCapito and Alice B. Moran. May 30, 1947. 3 pages. 5 cents.
2790. A study of murine typhus fever in Coffee County, Alabama. By Elmer L. Hill and Samuel C. Ingraham II. June 13, 1947. 8 pages. 5 cents.
2791. Incidence of poliomyelitis in 1946. By C. C. Dauer. June 20, 1947. 9 pages. 5 cents.
2792. Fly-abatement studies in urban poliomyelitis epidemics during 1945. By Joseph L. Melnick, Robert Ward, Dale R. Lindsay and F. Earle Lyman. June 20, 1947. 14 pages. 5 cents.
2793. Studies in deratization of surface vessels by means of 1080 (sodium fluoroacetate). By John H. Hughes. June 27, 1947. 8 pages. 5 cents.
2794. Yellow fever vaccine inactivation studies. By H. W. Burruss and M. V. Hargett. June 27, 1947. 17 pages. 10 cents.
2461. Individual sewage disposal systems. Recommendations of Joint Committee on Rural Sanitation. Revised 1947. 33 pages. 10 cents.

Supplements to Public Health Reports

194. Directory of full-time local health officers. (Revised to June 30, 1946). 1947. 44 pages. 15 cents.
195. The toxicology of antimony. By Lawrence T. Fairhall and Frances Hyslop. 1947. 41 pages. 15 cents.

National Institute of Health Bulletin

188. Xylidine (o,o-dimethylaniline): Its toxicity and potential dangers as compared with those of aniline and an appraisal of the potential hazards from its use in blending gasoline. By W. F. von Oettingen, P. A. Neal, R. F. Sievers, J. L. Svirbely, A. R. Monaco, B. L. Horecker, H. Yagoda, T. R. Sweeney, D. C. Peterson, W. C. Alford, V. B. Hauff and H. Gay. 1947. 124 pages. 30 cents.

Miscellaneous Publications

10. Regulations for the sale, barter, or exchange of any virus, therapeutic serum, toxin, antitoxin or analogous product or arsphenamine or its derivatives (or any other trivalent organic arsenic compound) in the District of Columbia or in interstate traffic or in export or import traffic. Approved: January 16, 1947 to supersede regulations issued October 12, 1940 and amendments thereto. 1947. 19 pages. 10 cents.
38. Dating decision number 10. The dating periods recommended for those biologic products specified in the biologics section of the Public Health Service Act of July 1, 1944. Issued May 15, 1947 to supersede dating decision number 9 issued January 25, 1943. 1947. 7 pages. 5 cents.

Annual Report

Annual Report of the United States Public Health Service for the fiscal year 1946. 1947. 165 pages. 35 cents.

Unnumbered Publications

Index to Public Health Reports, vol. 61, part 2, July–December 1946. 1947 18 pages. 10 cents.

Contents and indexes to Journal of the National Cancer Institute, volume 7, August 1946–June 1947. 1947. 6 pages. 5 cents.

DDT for control of household pests. Prepared by the Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, United States Department of Agriculture and the United States Public Health Service, Federal Security Agency. March 1947. 15 pages. 5 cents.

Guide to safe food service. A manual for use in organizing and conducting classes for food establishments employees. By John Andrews and Frances T. Champion. February 1946. 65 pages. 15 cents.

National Negro Health Week program. This pamphlet is published annually, usually during March, for community leaders in an effort to suggest ways and means by which interested individuals and organizations may be organized for a concerted and effective attack upon the community's disease problems. Thirty-third observance, March 30–April 6, 1947. 4 pages. Out of print.

National Negro Health Week leaflet. Thirty-third observance. 1947. 2 pages. Out of print.

National Negro Health Week poster. Thirty-third observance. 1947. Out of print.

Workers Health Series

2. Climate and Tuberculosis. June 1947. 5 cents; $1 per 100 copies.
9. Chronic Arthritis. May 1947. 5 cents; $1 per 100 copies.
12. Hemorrhoids (Piles). May 1947. 5 cents; $1 per 100 copies.
21. Home Care of the Sick. April 1947. 5 cents; $1 per 100 copies.

Reprints From The Journal of Venereal Disease Information

276. Streptomycin therapy of penicillin-resistant and sulfonamide-resistant specific and nonspecific urethritis. By Edwin J. Pulaski. January 1947. 6 pages. 5 cents.
277. Rapid treatment of early syphilis with penicillin in beeswax and oil. By Evan W. Thomas, Simeon Landy and Corrine Cooper. February 1947. 5 pages. 5 cents.
278. Syphilis mortality. January 1947. 2 pages. 5 cents.
279. Venereal disease interviewing. By Howard P. Steiger and Jane Barbara Taylor. April 1947. 6 pages. 5 cents.
280. The rural public health nurse in venereal disease control. By Frances S. Buck. April 1947. 4 pages. 5 cents.
281. Significance and interpretation of quantitative blood tests for syphilis. By Maurice C. Shepard. May 1947. 4 pages. 5 cents.
282. Penicillin therapy for syphilis in pregnancy. By Mortimer Speiser, Gerald Flaum, Dabney Moon-Adams and Evan W. Thomas. June 1947. 12 pages. 5 cents.
283. Considerations with respect to the application in private practice of penicillin therapy for early syphilis. By Onis G. Hazel. June 1947. 5 pages. 5 cents.

National Office of Vital Statistics Publications

Current Mortality Analysis (monthly), vol. 4, Nos. 10–13, 1946; vol. 5, Nos. 1–4, 1947.

A List of Current Publications of the National Office of Vital Statistics, January 1947. 6 pages.

Explanation of Items on Live Birth, Death, and Stillbirth Certificates, May 1947. 14 pages.

Monthly Marriage Report (marriage licenses issued in major cities), Series PM–4, Nos. 12, 13, 1946; New Series: vol. 1, Nos. 1–5, 1947.

Monthly Vital Statistics Bulletin, vol. 9, Nos. 11–13, 1946; vol. 10, Nos. 1–4, 1947.

Quarterly Marriage Report (marriage licenses issued in the United States by State, 1946), vol. 1, Nos. 3, 4, 5.

The Registrar (monthly), vol. 12, Nos. 1–6.

Vital Statistics—Special Reports, vol. 27, National Summaries:
  No. 1. Natality and mortality statistics: United States, 1945. 1 to 8 pages.
  No. 2. Deaths and death rates for each cause: United States, 1943–45. 9 to 25 pages.

Vital Statistics—Special Reports, vol. 26, State Summaries:
  No. 1. United States summary of vital statistics, 1945. 1 to 32 pages.
  Nos. 2–15. Summary of vital statistics, 1945, for each State, Alabama through Iowa (issued in alphabetic order). 33 to 200 pages.

Weekly Mortality Index, vol. 17, Nos. 52, 53, 1946; vol. 18, Nos. 1–25, 1947.

Where to Get a Birth or Death Certificate, May 1947. 4 pages.

DEATHS DURING WEEK ENDED DECEMBER 20, 1947

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Dec. 20, 1947	Corresponding week, 1946
Data for 93 large cities of the United States:		
Total deaths	9,643	9,378
Median for 3 prior years	9,163	
Total deaths, first 51 weeks of year	469,177	460,804
Deaths under 1 year of age	654	790
Median for 3 prior years	600	
Deaths under 1 year of age, first 51 weeks of year	37,246	34,215
Data from industrial insurance companies:		
Policies in force	66,963,740	67,304,021
Number of death claims	12,712	11,637
Death claims per 1,000 policies in force, annual rate	9.9	9.0
Death claims per 1,000 policies, first 51 weeks of year, annual rate	9.2	9.4

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED DECEMBER 27, 1947

Summary

The total of influenza cases reported for the current week, 3,835, is only slightly above last week's figure, 3,684, notwithstanding increases in Texas (from 1,498 to 2,015), Arizona (101 to 197), and California (55 to 131). Throughout the Northeastern and North Central States, only 40 cases were reported. For the 32 weeks, since July 27, average seasonal low date, 36,696 cases have been reported, as compared with 32,975 (which is also the 5-year median) for the corresponding period last year.

A total of 61 cases of poliomyelitis was reported, as compared with 54 last week, a 5-year median of 76, and 108 for the corresponding week last year. No State reported more than 10 cases. For the 41-week period, since March 15 (approximate average date of seasonal low incidence), 10,196 cases have been reported, as compared with 24,797 for the corresponding period last year and a 5-year median of 13,337. States reporting the largest numbers during this 41-week period (corresponding figures last year in parentheses) are as follows: Ohio 1,454 (702), New York 1,206 (1,429), Illinois 835 (2,542), California 702 (2,045), Michigan 633 (1,072), Pennsylvania 463 (275), Massachusetts 349 (381), Idaho 342 (52), New Jersey 292 (254), North Carolina 282 (146), Indiana 242 (432), Minnesota 230 (2,831).

During the current week, 1 case of smallpox was reported (in Indiana), 1 case of anthrax (in Pennsylvania), and 1 case of leprosy (in New York). Since the respective average seasonal low incidence dates, figures above the corresponding 5-year medians have been reported for measles and whooping cough; since the beginning of the year, for the dysenteries (combined), infectious encephalitis, Rocky Mountain spotted fever, and tularemia; and above the average of the past 2 years for undulant fever.

Deaths recorded during the current week in 93 large cities of the United States totaled 8,891, as compared with 9,643 last week, 9,380 and 11,399, respectively, for the corresponding weeks of 1946 and 1945, and a 3-year (1944-46) median of 9,934. The cumulative figure is 478,068, as compared with 470,184 for the same period last year. Infant deaths totaled 649, as compared with 654 last week and a 3-year median of 608, and for the year to date, 37,895, as compared with 34,936 for the period last year.

Telegraphic morbidity reports from State health officers for the week ended December 27, 1947, and comparison with corresponding week of 1946 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1942-46	Week ended—		Median 1942-46	Week ended—		Median 1942-46	Week ended—		Median 1942-46
	Dec. 27, 1947	Dec. 28, 1946		Dec. 27, 1947	Dec. 28, 1946		Dec. 27, 1947	Dec. 28, 1946		Dec. 27, 1947	Dec. 28, 1946	
NEW ENGLAND												
Maine	1	1	0	------	2	2	3	123	23	0	0	0
New Hampshire	0	0	0	------	1	------	1	5	1	0	0	0
Vermont	0	1	0	------	------	7	1	168	13	0	0	0
Massachusetts	10	20	8	------	------	------	60	197	197	0	1	6
Rhode Island	0	0	0	------	------	8	1	43	3	0	0	0
Connecticut	0	1	1	------	3	11	5	88	20	1	0	2
MIDDLE ATLANTIC												
New York	16	19	14	[1] 3	[1] 5	[1] 15	185	211	499	0	6	19
New Jersey	2	5	3	4	3	21	354	55	55	2	2	10
Pennsylvania	8	15	14	([2])	[2] 6	[2] 6	161	513	516	8	6	10
EAST NORTH CENTRAL												
Ohio	11	10	10	3	8	9	117	167	42	1	4	7
Indiana	14	16	9	1	3	17	93	15	15	0	1	4
Illinois	1	10	8	2	3	24	709	9	84	2	2	14
Michigan [3]	2	7	11	2	1	5	698	30	99	0	1	5
Wisconsin	0	1	3	13	15	45	87	57	57	1	1	1
WEST NORTH CENTRAL												
Minnesota	2	4	4	------	------	1	139	6	6	2	0	1
Iowa	2	6	3	------	------	------	123	4	11	0	0	2
Missouri	4	6	5	5	1	7	12	4	7	0	1	6
North Dakota	1	2	2	------	16	16	43	1	1	1	0	0
South Dakota	0	0	1	------	------	1	8	2	3	0	0	0
Nebraska	2	1	1	5	28	28	17	3	5	2	1	1
Kansas	0	3	5	2	17	17	4	6	23	0	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	3	1	4	1	0	0
Maryland [3]	11	7	7	1	2	4	3	10	10	0	1	2
District of Columbia	1	1	1	1	1	4	12	29	4	1	0	1
Virginia	7	6	7	419	487	487	215	41	41	2	0	6
West Virginia	9	3	2	76	45	45	119	63	6	1	1	1
North Carolina	6	4	14	------	------	7	------	48	17	0	1	4
South Carolina	2	1	7	357	271	674	14	24	24	0	1	1
Georgia	5	4	4	19	15	65	1	83	14	1	1	2
Florida	8	15	5	18	14	11	5	11	4	0	2	2
EAST SOUTH CENTRAL												
Kentucky	19	2	6	1	------	25	1	------	8	0	1	3
Tennessee	11	10	6	59	25	47	24	3	23	0	4	5
Alabama	10	8	12	135	91	194	4	13	4	1	1	3
Mississippi [3]	2	22	7	15	------	------	2	------	------	0	1	3
WEST SOUTH CENTRAL												
Arkansas	2	10	8	44	55	126	2	4	8	0	0	3
Louisiana	1	1	7	1	43	43	7	------	5	0	0	2
Oklahoma	4	8	8	180	85	93	5	3	3	2	2	1
Texas	26	19	33	2,015	1,159	2,121	409	42	50	3	4	4
MOUNTAIN												
Montana	0	2	2	3	16	16	112	55	55	0	0	1
Idaho	0	1	1	7	14	14	5	3	3	0	0	0
Wyoming	1	1	0	------	27	27	9	4	4	0	0	0
Colorado	4	13	6	72	31	42	27	10	25	1	0	1
New Mexico	2	8	1	1	1	1	------	11	------	0	0	1
Arizona	1	3	2	197	131	131	1	39	10	1	0	0
Utah [3]	16	1	0	14	------	55	6	4	10	3	0	1
Nevada	0	0	0	------	------	------	1	------	3	0	0	0
PACIFIC												
Washington	7	1	4	------	------	------	37	6	43	2	1	3
Oregon	1	0	4	29	22	22	2	20	37	2	1	2
California	12	21	24	131	13	30	246	17	146	4	4	14
Total	244	300	323	3,835	2,660	3,466	4,093	2,251	2,723	45	53	187
52 weeks	12,511	16,194	15,559	338,209	223,172	367,868	215,719	662,972	602,085	3,407	5,638	7,999
Seasonal low week [4]	(27th) July 5-11			(30th) July 26-Aug. 1			(35th) Aug. 30-Sept. 5			(37th) Sept. 13-19		
Total since low	6,214	7,566	8,410	36,696	32,975	32,975	30,217	22,887	26,124	766	972	1,504

---

[1] New York City only. [2] Philadelphia only. [3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended December 27, 1947, and comparison with corresponding week of 1946 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended— Dec. 27, 1947	Week ended— Dec. 28, 1946	Median 1942–46	Week ended— Dec. 27, 1947	Week ended— Dec. 28, 1946	Median 1942–46	Week ended— Dec. 27, 1947	Week ended— Dec. 28, 1946	Median 1942–46	Week ended— Dec. 27, 1947[5]	Week ended— Dec. 28, 1946	Median 1942–46
NEW ENGLAND												
Maine	1	0	0	20	13	22	0	0	0	1	0	1
New Hampshire	0	0	0	10	4	4	0	0	0	0	0	0
Vermont	0	1	0	2	9	9	0	0	0	0	0	0
Massachusetts	2	3	1	88	144	246	0	0	0	1	2	2
Rhode Island	0	1	0	9	7	7	0	0	0	0	0	0
Connecticut	0	1	0	12	23	29	0	0	0	2	0	0
MIDDLE ATLANTIC												
New York	6	8	3	118	220	252	0	0	0	3	1	2
New Jersey	0	2	1	31	56	60	0	0	0	0	1	1
Pennsylvania	2	1	1	175	90	197	0	0	0	12	0	2
EAST NORTH CENTRAL												
Ohio	4	0	0	231	249	225	0	0	0	0	1	2
Indiana	*0	0	0	46	92	78	1	0	0	2	0	0
Illinois	4	10	5	104	101	141	0	0	0	1	4	1
Michigan[3]	5	4	3	93	134	160	0	0	0	1	0	2
Wisconsin	0	11	8	42	73	109	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	2	3	0	36	35	62	0	0	0	0	0	0
Iowa	0	0	0	62	29	50	0	0	0	0	0	0
Missouri	1	7	3	34	34	45	0	0	0	1	1	1
North Dakota	0	1	1	4	2	11	0	0	0	0	0	0
South Dakota	0	0	0	11	4	10	0	0	0	0	0	0
Nebraska	0	5	0	30	30	30	0	0	0	0	0	0
Kansas	1	3	1	15	40	60	0	0	0	1	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	7	10	4	0	0	0	0	0	0
Maryland[3]	0	0	0	12	21	29	0	0	0	1	1	1
District of Columbia	0	0	0	4	10	26	0	0	0	0	0	0
Virginia	0	2	0	34	33	50	0	0	0	2	0	2
West Virginia	0	0	0	13	19	28	0	0	0	0	0	0
North Carolina	4	1	0	24	13	48	0	0	0	0	0	0
South Carolina	1	0	1	3	0	10	0	0	0	0	0	1
Georgia	1	0	0	9	6	17	0	0	0	1	0	0
Florida	1	9	0	8	7	9	0	0	0	6	3	2
EAST SOUTH CENTRAL												
Kentucky	2	0	0	18	4	49	0	0	0	0	2	1
Tennessee	1	2	0	40	40	21	0	0	0	3	6	1
Alabama	0	2	1	18	12	11	0	0	0	0	1	2
Mississippi[3]	0	5	1	3	8	8	0	0	0	1	0	0
WEST SOUTH CENTRAL												
Arkansas	1	3	1	0	3	8	0	0	1	0	0	2
Louisiana	0	0	0	4	1	11	0	0	0	3	1	2
Oklahoma	0	1	0	12	9	16	0	1	1	0	2	2
Texas	4	0	2	51	20	51	0	0	0	0	3	6
MOUNTAIN												
Montana	0	0	0	12	3	13	0	0	0	0	0	0
Idaho	10	0	0	5	8	17	0	0	0	1	2	0
Wyoming	1	0	0	7	20	10	0	0	0	0	0	0
Colorado	0	1	1	38	31	41	0	0	0	0	0	0
New Mexico	0	0	0	6	6	11	0	0	0	0	0	3
Arizona	1	0	0	4	11	11	0	0	0	0	0	0
Utah[3]	0	1	1	10	21	41	0	0	0	0	0	0
Nevada	0	0	0	1	0	0	0	0	0	0	0	0
PACIFIC												
Washington	1	6	4	30	81	65	0	0	0	0	3	1
Oregon	2	0	1	23	15	26	0	0	0	0	0	1
California	3	14	7	99	72	149	0	0	0	2	2	1
Total	61	108	76	1,668	1,873	2,858	1	1	5	45	36	51
52 weeks	*10,808	25,264	13,734	83,300	112,981	140,475	169	333	390	3,894	4,003	5,392
Seasonal low week[4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	*10,196	24,797	13,337	21,197	26,686	38,571	22	54	83	3,409	3,528	4,576

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately as follows: Maine 1; Connecticut 1; Kansas 1; Virginia 1; Louisiana 1.

*Delayed report (included in cumulative totals only): Poliomyelitis, Indiana, 9 cases.

Telegraphic morbidity reports from State health officers for the week ended December 27, 1947, and comparison with corresponding week of 1946 and 5-year median—Con.

Division and State	Whooping cough			Week ended December 27, 1947							
	Week ended—		Median 1942–46	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Dec. 27, 1947	Dec. 28, 1946		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	16	3	9	------	------	------	------	------	------	------	1
New Hampshire	9	1	7	------	------	------	------	------	------	------	------
Vermont	40	16	34	------	------	------	------	------	------	------	1
Massachusetts	102	141	94	------	10	------	------	------	------	------	1
Rhode Island	17	9	9	------	------	------	------	------	------	------	------
Connecticut	31	11	17	------	------	------	1	------	------	------	2
MIDDLE ATLANTIC											
New York	123	158	206	8	17	------	------	------	------	2	3
New Jersey	87	105	97	------	------	------	------	------	------	------	------
Pennsylvania	100	116	116	------	------	------	------	------	------	------	2
EAST NORTH CENTRAL											
Ohio	87	49	55	------	------	------	------	------	1	------	1
Indiana	32	32	15	------	7	------	1	------	3	------	2
Illinois	74	67	51	1	------	------	------	------	2	------	3
Michigan [3]	170	118	70	1	1	------	------	------	------	------	3
Wisconsin	113	177	67	------	------	------	------	------	------	------	2
WEST NORTH CENTRAL											
Minnesota	40	2	15	------	------	------	------	------	------	------	12
Iowa	20	10	12	------	------	------	------	------	------	------	1
Missouri	12	11	11	------	------	1	------	------	------	------	1
North Dakota	3	------	2	2	------	------	------	------	------	------	------
South Dakota	------	4	6	------	------	------	------	------	------	------	------
Nebraska	4	4	2	------	------	------	------	------	------	------	1
Kansas	22	6	12	------	------	------	------	------	1	------	2
SOUTH ATLANTIC											
Delaware	5	6	2	------	------	------	------	------	------	------	------
Maryland [3]	53	39	39	------	------	1	------	------	2	------	1
District of Columbia	3	4	4	------	------	------	------	------	------	------	------
Virginia	75	35	34	1	------	20	------	------	2	------	1
West Virginia	12	23	13	------	------	------	------	------	------	------	------
North Carolina	16	12	35	------	1	------	------	------	------	------	------
South Carolina	30	14	33	------	1	------	------	------	------	------	------
Georgia	4	19	4	------	2	------	------	------	------	2	4
Florida	26	48	6	1	------	------	------	------	------	------	1
EAST SOUTH CENTRAL											
Kentucky	3	23	11	------	------	------	------	------	------	------	------
Tennessee	15	9	19	------	------	------	------	------	1	------	1
Alabama	11	97	14	------	------	------	------	------	3	1	------
Mississippi [3]	3	------	------	------	------	------	------	------	2	------	------
WEST SOUTH CENTRAL											
Arkansas	1	11	17	3	------	52	------	------	3	1	------
Louisiana	8	2	------	------	------	------	------	------	------	------	------
Oklahoma	7	9	3	1	------	------	------	------	2	------	1
Texas	217	130	130	6	292	143	------	------	2	4	2
MOUNTAIN											
Montana	3	3	3	------	------	------	------	------	------	------	------
Idaho	31	3	2	------	------	------	------	------	------	------	1
Wyoming	8	10	3	------	------	------	------	------	2	------	------
Colorado	38	7	10	------	------	------	------	------	1	------	4
New Mexico	4	10	2	------	------	1	------	------	------	------	------
Arizona	19	14	7	------	------	20	------	------	------	------	------
Utah [3]	8	1	6	------	------	1	------	------	------	------	------
Nevada	------	------	------	------	------	------	------	------	------	------	------
PACIFIC											
Washington	25	7	17	------	------	------	------	------	------	------	1
Oregon	16	5	8	------	------	------	------	------	------	------	------
California	74	66	66	6	3	------	2	------	------	6	4
Total	1,817	1,647	1,570	30	334	239	4	0	27	16	59
Same week, 1946	1,647	------	------	33	289	136	8	1	63	24	83
Median, 1942–46	1,570	------	------	33	266	94	10	1	36	58	[6] 59
52 weeks: 1947	153,805	------	------	3,014	16,802	9,814	626	568	1,354	1,911	6,073
1946	100,212	------	------	2,427	16,712	6,487	617	578	1,179	3,351	5,337
Median, 1942–46	123,554	------	------	1,958	18,182	7,621	620	455	818	4,533	[6] 5,071

[3] Period ended earlier than Saturday.

[6] 2-year average, 1945–46.

Anthrax: Pennsylvania 1. Leprosy: New York 1.

Alaska, week ended December 27, 1947: Meningitis 1.

Territory of Hawaii, week ended December 27, 1947: Bacillary dysentery 1, influenza 1, whooping cough 16. Corrections: Week ended December 20, 1947, leprosy 1 (instead of 0); whooping cough 42 (instead of 38).

WEEKLY REPORTS FROM CITIES *

City reports for week ended December 20, 1947

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	-------	0	1	0	0	6	0	9
New Hampshire:												
Concord	0	0	------	0	-------	0	1	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	-------	0	0	0	0	0	0	------
Massachusetts:												
Boston	5	0	------	1	66	1	14	1	20	0	0	20
Fall River	0	0	------	0	1	0	1	0	1	0	1	1
Springfield	0	0	------	0	2	0	0	0	6	0	0	6
Worcester	0	0	------	0	2	0	6	0	6	0	0	17
Rhode Island:												
Providence	0	0	------	0	1	0	5	0	6	0	1	18
Connecticut:												
Bridgeport	0	0	------	0	-------	0	0	0	1	0	0	1
Hartford	0	0	------	0	1	0	0	0	2	0	0	14
New Haven	0	0	------	0	-------	0	1	0	0	0	0	9
MIDDLE ATLANTIC												
New York:												
Buffalo	2	0	------	2	-------	0	8	0	5	0	0	4
New York	12	0	6	3	149	3	88	3	53	0	0	31
Rochester	0	0	------	0	-------	0	1	0	9	0	0	12
Syracuse	6	0	------	0	-------	0	1	1	1	0	0	20
New Jersey:												
Camden	0	0	------	0	-------	0	4	0	0	0	0	4
Newark	0	0	1	0	5	0	8	0	6	0	0	7
Trenton	2	0	------	0	1	0	2	0	1	0	0	------
Pennsylvania:												
Philadelphia	1	0	2	1	31	0	22	2	38	0	0	43
Pittsburgh	0	1	------	2	1	4	4	0	15	0	0	19
Reading	0	0	------	0	-------	0	1	0	5	0	0	11
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	-------	1	6	0	4	0	0	2
Cleveland	1	0	------	0	2	0	5	2	26	0	0	28
Columbus	5	0	1	1	41	0	1	0	9	0	0	18
Indiana:												
Fort Wayne	0	0	------	0	-------	0	2	0	8	0	0	------
Indianapolis	3	0	------	0	1	0	5	1	5	0	0	8
South Bend	0	0	------	0	1	0	0	0	0	0	0	------
Terre Haute	0	0	------	0	3	0	0	0	0	0	0	------
Illinois:												
Chicago	0	0	3	0	223	0	31	1	32	0	0	19
Michigan:												
Detroit	0	0	2	0	5	0	13	2	23	0	0	39
Flint	0	0	------	0	-------	0	2	0	6	0	0	8
Grand Rapids	0	0	------	0	35	0	1	0	8	0	0	15
Wisconsin:												
Kenosha	0	0	------	0	1	0	0	0	0	0	0	------
Milwaukee	0	0	------	0	5	0	3	0	12	0	0	11
Racine	0	0	------	0	1	0	0	0	3	0	0	5
Superior	0	0	------	0	-------	0	0	0	1	0	0	7
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	-------	0	8	0	1	0	0	16
St. Paul	0	0	------	0	5	0	2	0	6	0	0	28
Missouri:												
Kansas City	1	0	6	0	1	0	8	0	1	0	0	16
St. Joseph	0	0	------	0	-------	1	0	0	4	0	0	1
St. Louis	5	0	3	0	1	1	7	1	9	0	2	5

* In some instances the figures include nonresident cases.

City reports for week ended Dec. 20, 1947—Continued

Division State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	9	0	0	0	1	0	0	2
Nebraska:												
Omaha	0	0	------	0	------	0	3	0	2	0	0	7
Kansas:												
Topeka	0	0	------	0	1	0	0	0	0	0	0	1
Wichita	0	0	------	0	------	0	3	0	4	0	0	3
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	------	0	1	0	2	0	0	------
Maryland:												
Baltimore	2	0	1	1	1	0	3	1	9	0	0	42
Cumberland	1	0	------	0	------	0	0	0	0	0	0	------
Frederick	0	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	1	18	0	6	0	8	0	1	9
Virginia:												
Lynchburg	0	0	------	0	------	0	0	0	0	0	0	12
Richmond	0	0	------	1	1	2	3	0	7	0	0	10
Roanoke	0	0	------	0	------	0	0	0	1	0	0	2
West Virginia:												
Charleston	0	0	------	0	------	0	5	0	0	0	0	------
Wheeling	0	0	------	0	1	0	0	0	1	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	0	0	0	0	0	0	4
Wilmington	0	0	------	0	------	0	0	0	1	0	0	------
Winston-Salem	0	0	------	0	------	0	2	1	3	0	0	5
South Carolina:												
Charleston	0	0	108	0	1	0	2	0	0	0	0	2
Georgia:												
Atlanta	0	0	2	2	------	0	4	1	5	0	0	2
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Savannah	0	0	4	0	------	0	1	0	2	0	0	3
Florida:												
Tampa	1	0	------	0	2	0	4	0	0	0	1	1
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	9	0	1	0	0	0	2	2
Nashville	0	0	------	0	------	0	1	0	3	0	0	2
Alabama:												
Birmingham	0	0	------	0	------	0	3	0	1	0	0	------
Mobile	1	0	12	0	------	0	3	0	2	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	------	0	2	0	0	0	0	1
Louisiana:												
New Orleans	0	0	------	0	------	0	6	1	3	0	0	1
Shreveport	1	0	------	0	------	0	2	0	0	0	0	------
Oklahoma:												
Oklahoma City	0	0	2	0	------	0	1	0	5	0	1	2
Texas:												
Dallas	0	0	1	1	------	0	6	0	1	0	0	2
Galveston	0	0	------	0	------	0	2	0	1	0	0	------
Houston	0	0	------	0	6	0	1	0	0	0	0	2
San Antonio	0	0	1	1	------	1	4	0	2	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	53	0	1	0	1	0	0	------
Great Falls	0	0	------	0	1	0	0	0	0	0	0	------
Helena	0	0	------	0	3	0	0	0	0	0	0	------
Missoula	0	0	------	0	6	0	1	0	1	0	0	4
Colorado:												
Denver	4	0	2	1	3	0	3	0	14	0	0	11
Pueblo	0	0	------	0	------	0	0	0	7	0	0	25
Utah:												
Salt Lake City	0	0	------	0	3	0	0	1	1	0	0	------

City reports for week ended December 20, 1947—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	1	2	1	8	0	7	0	0	10
Spokane	0	0	------	0	1	0	0	0	3	0	0	------
Tacoma	0	0	------	0	33	0	0	0	3	0	0	1
California:												
Los Angeles	2	0	19	3	24	0	2	0	22	0	0	13
Sacramento	0	0	------	0	3	0	6	0	5	0	0	------
Total	55	1	176	22	766	15	351	19	456	0	9	643
Corresponding week, 1946 [1]	122	------	92	21	738	------	298	------	491	1	11	531
Average 1942-46 [1]	77	------	1,367	[2] 47	[3] 981	------	[3] 431	------	794	0	9	561

[1] Exclusive of Oklahoma City.
[2] 3-year average, 1944-46.
[3] 5-year median, 1942-46.

Dysentery, amebic.—Cases: New York 6; New Orleans 2; San Antonio 1; Los Angeles 2.
Dysentery, bacillary.—Cases: Worcester 4; Charleston, S. C. 1; San Antonio 1; Los Angeles 3.
Dysentery, unspecified.—Cases: Baltimore 1; San Antonio 4.
Tularemia.—Cases: St. Louis 1; Baltimore 1; Washington 1; New Orleans 2.
Typhus fever, endemic.—Cases: New York 1; Memphis 1; Nashville 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (latest available estimated population, 33,260,600)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	13.1	0.0	0.0	2.6	191	2.6	75.8	2.6	110	0.0	5.2	248
Middle Atlantic	10.6	0.5	4.2	3.7	87	3.2	64.3	2.8	62	0.0	0.0	70
East North Central	5.5	0.0	3.7	0.6	195	0.6	42.3	3.7	81	0.0	0.0	95
West North Central	14.6	0.0	21.9	0.0	41	4.9	63.2	2.4	68	0.6	4.9	180
South Atlantic	6.5	0.0	188.0	8.2	39	3.3	50.7	4.9	64	0.0	3.3	150
East South Central	5.9	0.0	70.8	0.0	53	0.0	47.2	0.0	35	0.0	11.8	24
West South Central	2.5	0.0	10.2	5.1	15	2.5	61.0	2.5	30	0.0	2.5	20
Mountain	33.0	0.0	16.5	8.3	570	0.0	74.3	8.3	198	0.0	0.0	330
Pacific	4.2	0.0	39.6	8.3	131	2.1	33.3	0.0	83	0.0	0.0	50
Total	8.6	0.2	27.7	3.5	120	2.4	55.2	3.0	72	0.0	1.4	101

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended December 6, 1947.—During the week ended December 6, 1947, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbie	Total
Chickenpox		72	4	216	453	70	108	69	78	1,070
Diphtheria		1	1	16	14	2	1	1		36
Dysentery:										
Amebic					1					1
Bacillary				1						1
Encephalitis, infectious				1				2		3
German measles				3	13		2	17	7	42
Influenza		12			12				14	38
Measles		2		353	252	28	17	14	92	758
Meningitis, meningococcus								2	2	4
Mumps		39		271	196	30	35	47	27	645
Poliomyelitis		1		1	3		13	1	1	20
Scarlet fever		12	6	60	78	5	3	16	5	185
Tuberculosis (all forms)		3	18	72	43	35	31	24	73	299
Typhoid and paratyphoid fever				7	2	2	1			12
Undulant fever				1				2		3
Venereal diseases:										
Gonorrhea	2	15	12	79	100	23	23	41	66	361
Syphilis	1	10	2	80	67	13	11	6	18	208
Other forms				1					1	2
Whooping cough			1	40	70	37	6	41	42	237

UNITED STATES-MEXICAN BORDER

Cerebrospinal meningitis outbreak.—Under date of December 9, 1947, an outbreak of cerebrospinal meningitis was reported in Mexicali, Mexico, with 12 cases during the week ended December 8. Up to December 24, 21 cases with 3 deaths had been reported in Mexicali, and in California 4 cases 1 death in Imperial County and 2 cases in Riverside County.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

Egypt.—Semi-official information dated December 10, states that the incidence of cholera in Egypt during the preceding week averaged about one case a day. The disease is now confined to Faiyum Province. It is understood that Egyptian authorities will not declare Egypt free from infection until 10 days after the last case is reported.

Syria.—Information received December 31, states that during the period December 19–28, 27 cases of cholera with 9 deaths were reported in Hauran Province, and for the same period 14 cases with 4 deaths were reported in Damascus Muhasazet. None was reported in the city of Damascus. No additional cases or deaths were reported in Syria on December 29 or 30.

Smallpox

Iran.—For the week ended November 8, 1947, 46 cases of smallpox with 2 deaths were reported in Iran.

Sudan (Anglo-Egyptian).—During the week ended November 29, 1947, 180 cases of smallpox with 13 deaths were reported in Anglo-Egyptian Sudan.

×

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. : 1948

For sale by the Superintendent of Documents, United States Government Printing Office Washington 25, D.C.

Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 JANUARY 23, 1948 NUMBER 4

IN THIS ISSUE

Improved Dishwashing Detergent Performance Test

Studies in Enterococcal Food Poisoning

CONTENTS

Page

Some improvements in the performance test for rating dishwashing detergents. Francis I. Norris and C. C. Ruchhoft ---------- 97
Studies in enterococcal food poisoning. I. The isolation of enterococci from foods implicated in several outbreaks of food poisoning. L. Buchbinder, A. G. Osler, and G. I. Steffen ---------- 109
Court decision on public health ---------- 118

INCIDENCE OF DISEASE

United States:
  Reports from States for week ended January 3, 1948, and comparison with former years ---------- 120
  Weekly reports from cities:
    City reports for week, ended December 27, 1947 ---------- 124
    Rates, by geographic divisions, for a group of selected cities ---------- 126
Deaths during week ended December 27, 1947 ---------- 126
Foreign reports:
  Canada—Provinces—Communicable diseases—Week ended December 13, 1947 ---------- 127
  Cuba—
    Habana—Communicable diseases—4 weeks ended November 29, 1947 ---------- 127
    Provinces—Notifiable diseases—4 weeks ended November 29, 1947 ---------- 127
  Finland—Notifiable diseases—October 1947 ---------- 128
  Great Britain—Poliomyelitis ---------- 128
  Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—
    Cholera ---------- 128
    Plague ---------- 128
    Smallpox ---------- 128

Public Health Reports

Vol. 63 ◦ JANUARY 23, 1948 • *No. 4*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

SOME IMPROVEMENTS IN THE PERFORMANCE TEST FOR RATING DISHWASHING DETERGENTS[1]

By FRANCIS I. NORRIS, *S. A. Sanitarian (R)* and C. C. RUCHHOFT, *Principal Chemist, United States Public Health Service*

A washing performance test for studying detergents to be used in the cleansing of dishes and utensils in dairy and restaurant sanitization was presented in an earlier paper (*1*) from this laboratory. A detailed description of a standardized technique for performing the test was given and it was pointed out that changes in the washing machine, in the composition of the soil and in the techniques of the test would all affect the results obtained. Since the publication of the first paper, work has been continued on the application of the test to a number of detergents and additional factors have been found which affect the washing performance of a detergent tested by this procedure. It was found that the soiling technique formerly recommended did not guarantee reproducibility and the simple empirical method of calculation was not satisfactory for precise work. Improvements in the technique have been devised and because of the interest shown in the test they are being presented for the benefit of workers in the field.

METHOD OF CALCULATING THE RESULTS

The original method suggested for calculating the results of a washing performance test was based for simplicity on the assumption that the soil removed was directly proportional to the difference in the photometer readings that indicated light absorbed by the soil. This assumption, which is not strictly correct, provided a simple method of calculation that was believed sufficiently accurate for use in connection with the test. Actually the soil removed, according to Lambert's law, varies directly with the difference in the logarithms of the photometer readings. For solids Lambert's and Beer's laws state that the following relationship holds:

$$I = I_o\, 10^{-Kd}$$

or

$$Kd = \log \frac{I}{I_o}$$

---

[1] From the Sanitary Engineering Division.

where: I=the intensity of the light transmitted; I_O=the intensity of the incident light; K=a constant for the wavelength and compound and; d=the thickness of the soil.

This equation indicates that the thickness of the soil is proportioned to the logarithm of the intensity of the transmitted light over the intensity of the incident light.

Let R represent the percentage of soil removed by washing. Then:

$$R=\frac{\text{original soil on slides}-\text{soil remaining after washing}}{\text{original soil on slides}}\times 100 \quad (1)$$

To make the above calculation for this test, all that is required is to substitute the proper light absorption values for each term in the above equation. In the test the following light intensities are obtained directly by photometer readings:

I_o=incident light=the initial reading with no slides in the photometer.

I_s=transmitted light through soiled slides, i. e., meter reading with soiled slides in the photometer.

I_c=transmitted light through clean slides, i. e., meter reading with the original clean slides in the photometer.

I_w=transmitted light through washed slides, i. e., meter reading with washed slides in the photometer.

Since the thickness of the soil is proportional to the log $\frac{I}{I_o}$ we can define the terms in equation 1, above, directly in light values. The light absorbed by the original soil on the slides may be represented by, log $\frac{I_c}{I_o}$—log $\frac{I_s}{I_o}$ and the light absorbed by the soil remaining after washing may be represented by, log $\frac{I_c}{I_o}$—log $\frac{I_w}{I_o}$

Substituting these values in equation 1 we have—

$$R=\frac{\left(\log\frac{I_c}{I_o}-\log\frac{I_s}{I_o}\right)-\left(\log\frac{I_c}{I_o}-\log\frac{I_w}{I_o}\right)}{\log\frac{I_c}{I_o}-\log\frac{I_s}{I_o}}\times 100$$

Now it will be noticed that I_o appears in the denominator of every term. Consequently in this equation, if I_o is kept constant throughout an observation of clean, soiled and washed slides the above equation becomes:

$$R=\frac{(\log I_c-\log I_s)-(\log I_c-\log I_w)}{\log I_c-\log I_s}\times 100$$

$$=\frac{\log I_w-\log I_s}{\log I_c-\log I_s}\times 100 \quad (2)$$

To make a calculation of the percentage of soil removed in a washing performance test, it is necessary only to keep I_0 constant, substitute the logarithms of the meter readings for the clean, soiled and washed slides in equation 2 and complete the computation.

The comparative results for soil removal obtained on a series of tests with trisodium phosphate solution calculated by the original simple empirical procedure and also by equation 2 are as follows:

	Percentage of soil removed								Coefficient of variation percent	Standard deviation percent
Determination No.	1	2	3	4	5	6	7	Mean		
Calculation by Meth. (1) [1]	25. 2	33. 3	33. 3	89. 0	88. 0	88. 5	91. 0	63. 3	45. 2	±28. 6
Calculation by Meth. (2) [2]	51. 2	60. 2	60. 2	93. 8	95. 8	96. 9	97. 3	79. 3	24. 5	±19. 4

[1] Simple empirical calculation.
[2] Equation 2 calculation.

In the above determinations and in all other tests presented, six slides were washed and examined simultaneously as recommended in the original procedure. These data indicate that the Lambert's law calculation procedure, equation 2, gives consistently higher and truer percentages of soil removal. The data also show that this method of calculation gives a lower standard deviation and coefficient of variation in a series of tests on the same detergent. Equation 2 has therefore been adopted for the calculation of the results of all tests made in this laboratory and is recommended for use with the test where the most precise results are desired for comparative purposes.

STUDY OF SOILING TECHNIQUE AND EFFECT OF THICKNESS OF SOIL ON THE REMOVAL EFFICIENCY

In the data on the efficiency of trisodium phosphate presented above, the results on the first three determinations were obtained on slides soiled and washed on one day and determinations 4 to 7 were obtained on slides soiled some days later and washed. It will be noticed that the results were very consistent on the determinations in which the slides were soiled at the same time and that a big difference occurred in the groups of determinations on slides soiled on different days. Such differences in efficiency with successive tests on the same detergent were considered too great. Consequently a careful search was made for the possible factors that contributed to the variability in the results of the performance test. Many theories were followed up to account for this variability without finding the cause of the principal difficulty. A comparison of photometer readings of the soiled slides and the subsequent percentage of soil removed indicated a slight tendency for greater washing efficiencies with low I_s readings indicating heavily soiled slides. This suggested that soil density on the slide might be important and a study of this factor was undertaken.

The original technique of spreading the undiluted Hucker (*2*) soil on the slides with a rubber roll was not suitable for the accurate control of soil thickness. Consequently the soiling technique was modified by immersing the clean slides in a bath containing soil diluted to a definite viscosity, draining and thereafter baking as usual. To study this procedure, 8 sets of 6 slides held in Coplin staining racks were dipped into a 25 percent dilution of soil and allowed to drain horizontally for 1 to 15 minutes. The intensity of the light transmitted, I_s, by the slides treated by this procedure follows:

Slide set No.	1	2	3	4	5	6	7	8
Draining time (minutes)	1	2	3	3	5	5	10	15
Intensity transmitted I_s	7.	9.	9.	10.	8.	10.5	10.	10.

From this experiment a draining time of 5 to 10 minutes was selected before baking. Draining the slides in the vertical position was also adopted because in this position a smaller area of heavy bead was formed near the bottom edge.

A series of washing performance tests were made with 0.3 percent trisodium phosphate solution in Cincinnati tap water at 140° F. for 3 minutes on four series of slides on which the soil thickness was controlled by dipping the slides into soil dilutions of known viscosity. Unfortunately three different batches of Hucker soil had to be used in the successive experiments. The pertinent results obtained in these experiments and in one series in which the original rolling technique of soiling was used, are given in table 1.

TABLE 1.—*Results of washing performance tests on trisodium phosphate solution showing the effect of method of application and thickness of soil on the test*

Slide soiling technique	Batch of Hucker soil	Number of determinations	Viscosity of soil dilution* seconds	Soiled slides		Mean percent soil removed	Standard deviation percent	Coefficient of variation percent
				I_s	Coefficient of variation in I_s			
Rolling	A	7		3	87	79	19	25
Dipping	B	15	[1] 26.2	6	23	86	5.1	5.9
Dipping	C1	9	[2] 26.4	23	4	52	8.4	16.2
Dipping	C2	6	[3] 28.5	15	10	87	4.8	5.5
Dipping	C3	6	[4] 36.3	5	24	90	.7	.7
Dipping	[6] C2	3	[5] 30.9	8	7	93.3	.6	.6

*The viscosities were determined with a 25 ml. pipette which delivered 25 ml. of distilled water in 23 seconds at 28° C.

Six slides used in each determination:

[1] at 28° C., [2] at 24° C., [3] at 21° C., [4] at 23° C., [5] at 24° C.

[6] Aged 3 months, same percentage dilution as C2.

The data in table 1 indicate that both the batch of soil and the viscosity of the dilution of soil used for soiling slides effects the percentage of soil removal obtained. As the viscosity of soil dilution was increased in the three series of tests in which the same batch of soil was used the I_s readings of 23, 15, and 5 indicated increased thickness of soil on the slides. As the soil thickness was increased in these series of tests the percentage of removal increased successively from 52 percent to 87 percent to 93 percent and 99 percent. The direct correlation between the thickness of soil on the slides and the percentage of soil removed by the detergent in this test is the most important factor shown by these data.

It will also be noticed in table 1 that the coefficient of variation of the transmitted light intensity I_s, of the soiled slides decreased as the mean value of I_s increased. In other words the uniformity of the soil on the slides varied inversely with the thickness of this soil. It is also apparent that the new soiling procedure reduced the standard deviation and coefficient of variation in the performance in all series of performance tests below that obtained in the series where the soil was applied by rolling.

EFFECT OF THICKNESS OF SOIL ON WASHING PERFORMANCE WITH VARIOUS DETERGENTS

To determine whether soil thickness was also an important factor in the performance of other detergents performance tests with slides having different thickness of soil were run with seven detergents. The results of these tests have been summarized in table 2.

TABLE 2.—*The effect of thickness of soil on the percentage of soil removed by various detergents*

		Mean percentage of soil removed				Standard deviation from mean				Coefficient of variation			
Mean I_s, indicating soil thickness [1]		5-9	10-14	15-19	20-25	5-9	10-14	15-19	20-25	5-9	10-14	15-19	20-25
Detergent	No. of Tests												
Tap water	26	-----	13	7	0	-----	8	6	-----	-----	68	86	-----
Borax	24	29	21	11	0	7	4	5	-----	25	20	50	-----
Sodium carbonate	74	72	59	54	32	10	9	11	11	14	15	21	34
Sodium meta silicate	16	73	70	-----	41	13	7	-----	4	18	11	-----	10
Trisodium phosphate	83	80	-----	69	64	11	-----	13	12	14	-----	19	19
Detergent A	12	93	-----	-----	76	1.7	-----	-----	3	2	-----	-----	4
Castile soap	12	97	94	-----	77	0.5	1.2	-----	9	0.5	1.3	-----	4
Detergent B	34	98	-----	94	83	2	-----	3	9	2	-----	-----	10
Average	--------	77	61	57	53	-----	-----	-----	-----	-----	-----	-----	-----

[1] The thickness of soil is inversely proportional to the logarithm of I_s (the transmitted light through the soiled slides).

These data show that with every detergent tested the percentage of soil removed depended somewhat on the soil density or thickness. It is true that the performance of the best performers in this group were less affected by this factor than the others. The importance of the soil thickness factor in this test is best illustrated in the results with sodium carbonate which might be classified in a short series of tests either as a poor detergent or a good detergent depending upon the quantity of soil applied to the slides. With all detergents a larger percentage of soil removal is shown when high concentrations of soil are on the slides. Consequently high soil concentrations decrease the spread in the percentage performance of the poor to excellent detergents. The lower soil concentrations increase the performance spread from the poor to the best detergents.

On the basis of the data presented in tables 1 and 2 it becomes apparent that comparative results on detergents under study in different laboratories or even in the same laboratory can not be obtained by this test until not only the composition of soil but the soil thickness on the slides as indicated by the soiled slide reading, I_s, is very carefully standardized. To maintain a good spread in performance on poor to excellent detergents and at the same time minimize the deviations in a series of tests on the same detergent a medium soil thickness on the slides is recommended. This may be obtained by diluting the Hucker soil the necessary amount to produce slides with average I_s readings between 15 and 20 after they are dipped into the soil solution, drained for 5–10 minutes and baked as usual at 95° C. It is possible that continued study of this method of testing will indicate the desirability of tests at two soil thickness ranges.

SOME OBSERVATIONS ON THE TRANSMITTED LIGHT READINGS THROUGH SOILED AND WASHED SLIDES

A compilation of the transmitted light readings for the washed slides indicated that these readings were about constant for each detergent regardless of soil thickness at the start. These data are shown in table 3.

TABLE 3.—*Comparison of mean washed slide readings for corresponding soiled slide reading ranges for representative detergents*

[Transmitted light, washed slides, I_w (mean)]

Transmitted light—Soiled slide I_s (range)	Detergents							
	Tap water	Borax	Sodium carbonate	Sodium meta silicate	Trisodium phosphate	Det. A	Castile soap	Det. B
5–9	--------	11.1	24.6	24.1	29.3	34.3	37.5	37.5
10–14	16.9	16.7	23.7	27.3	--------	------	37.5	------
15–19	18.1	19.8	26.2	--------	30.7	------	--------	37.5
20–25	22.6	23.0	25.8	28.3	32.3	33.6	35.0	36.0
Mean	19.2	17.7	25.1	26.6	30.8	34.0	36.7	37.1

In this study a total of 74 washing performance tests were made with sodium carbonate, using soil thicknesses represented by soiled slide readings from 5 to 25. The mean washed slide reading for this entire series was 25.5 with a standard deviation of ±2.9 and a coefficient of variation of ±11.0 percent. A maximum washed slide reading of 32.5 and a minimum of 19.6 was observed in this series. The coefficient of correlation between the soiled and washed slide light readings on this series of tests was 0.27 demonstrating that there was little correlation between these parameters.

In table 3 the data on washed slides for tap water alone and for borax do not show any constancy as the soil thickness is varied. A relatively constant washed slide reading that is independent of the soiled slide reading is indicated for the other detergents in this table. From the data given it may be assumed that with detergents in the washing performance category of detergents better than sodium carbonate, the washed slide reading will be indicative of the performance of the detergent and will be independent of the thickness of soil on the slide. The washing performance of a detergent may therefore be estimated from the washed slide readings only, on the basis of the above assumption. A curve showing the relationship between the washed slide readings I_w and the percentage of soil removed prepared from tables 2 and 3 is shown in Figure 1.

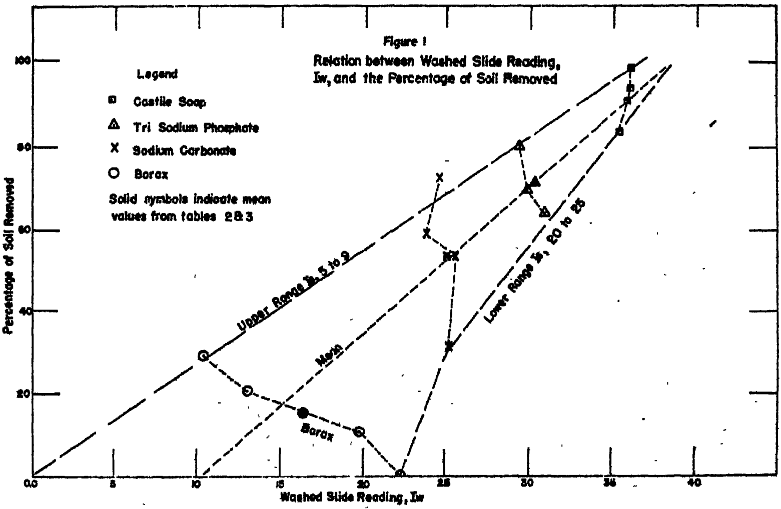


Figure 1

Relation between Washed Slide Reading, Iw, and the Percentage of Soil Removed

IMPLICATIONS OF THE CONSTANT WASHED SLIDE READING, I_w

The observation that the washed slide readings I_w for a given detergent are more or less constant tends to support an electric charge theory of soil removal. According to van der Werth (*3*) soil particles have a positive charge and soap particles have a negative charge permitting union of the soil and the soap. Tyutyunnikov (*4*) suggests that detergent capacity can best be expressed in terms of the energy required between the substrate and the soil. Boutaric and Perreau (*5*) studied the change in electrical charge on colloids and found that the charge may be reversed with the change in concentration of the electrolyte causing flocculation or dispersion. Briggs (*6*) postulates that every solid has a specific absorbing power for a given ion which depends upon a number of factors. These factors include the specific surface of the solid, the temperature, the concentration of the particular ion in the solution, and upon the other ions present or absorbed previously by the solid.

Glass is usually negatively charged when placed in water (*6*). If the soil is positively charged it will be attracted and held on the glass electrically. If a solution of detergent comes into contact with the soiled glass to remove the soil the attraction of the particles in the solution for the soil must be higher than the attraction of the glass for the soil. Or the particles formed by chemical action of the detergent on the soil must have a lower attractive force for the glass. In our test the concentration, temperature, and chemical action of the detergent solution and the mechanical action of the washing machine are all constant, and the amount of soil removed is dependent upon the breaking of the electrical union between the glass and soil. If the glass has a specific absorption power for a given ion, and the attraction of the glass for the soil particles is constant, the amount of soil adhering to the glass after treatment with any given detergent will be constant and independent of the original thickness of the soil. The soil changed chemically by the action of the detergent or the calcium or magnesium hardness salts precipitated from the water may be substituted for the original soil film and adhere to the glass slide depending upon the charge on the glass. Electrolytes in the detergent may reverse the charge of particles in the solution so that a film of greater density or thickness may be built upon the glass slide. This may explain why some calcium and magnesium compounds will form a heavier film than others depending upon the precipitant.

As indicated in table 3, borax does not produce a constant washed slide reading, I_w. The charge of the borax may approach that of the glass so that the removal shown may be strictly due to the mechanical work of the machine. It will be noticed in table 3, also, that the soil removal obtained when the slides are washed in tap water alone approaches that shown by borax.

Another series of experiments were made on eight sets of slides boiled in a detergent solution which are pertinent to this discussion. In these experiments one set of clean slides was used having an I_c reading of 42. Seven sets of slides were soiled and had I_s readings from 14.5 to 35.0. Each set of these slides was boiled for 5 minutes in a 0.3 percent solution of sodium carbonate containing also 0.1

percent of the Hucker soil. Each set was dried without rinsing before examination. The results given in table 4 show final I_w readings within a range of 21.5 and 28.5 with a mean of 24.7.

TABLE 4.—*Transmitted light readings, I_w, on a number of sets of slides boiled in sodium carbonate solution containing Hucker soil.*

Set No.	Original condition	Original light reading, I_c or I_s	Final light reading, I_w	Deviation from mean
1	Clean	42	25.5	+0.8
2	Soiled	24.5	26.0	+1.3
3	Soiled	28.5	28.5	+3.8
4	Soiled	26.0	25.0	+0.3
5	Soiled	32.5	24.5	−0.2
6	Soiled	35.0	22.5	−2.2
7	Soiled	16.0	21.5	−3.2
8	Soiled	14.5	24.0	−0.7
Mean			24.7	

It was found that the mean I_w readings on the series of washing performance tests with sodium carbonate was 25.5. This compares to the mean value of 24.7 found in this series of tests when slides with various initial readings were boiled with sodium carbonate containing some of the same soil. It will also be noted that if the set of slides were cleaner than indicated by an I_w reading of 24.7 a build up of soil occurred in all cases except one and if the slides had a lower reading than 24.7 initially a removal of soil was indicated and this mean was approached. The data of these experiments seem to support the proposed electrical attraction theory of soil removal and build-up.

The variations in the transmitted light readings for the washed slides, I_w, with a given detergent indicate and emphasize the importance of standardizing the soiled slide readings within a limited range if reproducible and constant washing performance results are to be obtained by different laboratories. For example with the soiled slide reading range maintained between 15 to 20, the percentage removal of soil by sodium carbonate, which gives a mean I_w of 25.5 ± 2.9 will vary considerably. With I_s at 15 and I_w at 25.5 ± 2.9 the removal performance would spread from 42 to 65 percent and with I_s at 20 and I_w at 25.5 ± 2.9 the performance would spread from 18 to 51 percent. Consequently values from 18 percent to 65 percent removal of soil are frequently obtained with sodium carbonate in Cincinnati tap water even when the soil thickness is held between I_s reading limits of 15 to 20. This variability in the performance test results with sodium carbonate may be associated with variations in the soil and in the chemical constituents of the Cincinnati water. Consequently sodium carbonate is not recommended as a reference detergent and the other chemical detergents shown in table 2 with less variability will serve better as reference detergents.

EFFECT OF VARIOUS BATCHES OF HUCKER SOIL ON THE TEST

The data in table 1 suggested that the washing performance obtained with trisodium phosphate was also affected by a variation in different batches of Hucker soil. A careful study of the effect of soil composition on performance obtained with a series of detergents when the soil density on the slides has been controlled is needed. Unfortunately we have not been able to undertake this study to the present. However, it appears that certain slight modifications in the preparation of the present Hucker soil will improve the uniformity of the batches. It is recommended that the soil be prepared by weighing the 0.5 gm. portion of printer's ink and linseed oil mixture in place of measuring this mixture volumetrically by drops. A difference in drop size of the ink and linseed oil will give different degrees of grayness to the soil film. Since it is necessary to control the thickness of the film on the slides by the I_s reading it is also necessary that the above important elements of light absorption of the soil be carefully controlled in making up each batch.

OTHER FACTORS AFFECTING THE TEST PROCEDURE

It was observed that after continued use the light bulb in the photometer becomes darker and transmits less light. The darkening of the bulb caused a gradual lowering of the transmittancy reading, I_c, when the technique originally recommended was followed. To avoid this the present technique is to adjust the variable resistances on the photometer until a reading of 40 is obtained with the clean slides. In other words I_c is always 40, and I_0, the initial or reference reading is recorded after the clean slides are removed.

Originally it was suggested that the detergent solution should cover the washing head about ½ inch. It is best to increase the depth of the solution over the washing head to about ¾ inch. This prevents the possible whipping of air into the solution which would produce foam and change the interface between the solution and the soil on the slides.

Finally the washing machine should be checked frequently to see that all bearings have sufficient oil and that undue slipping does not occur due to wear of the bolts or oil on the pulleys.

RECOMMENDED IMPROVED TEST PROCEDURE

As a result of this study the following improved procedure is recommended for determining the percentage of soil removed by a detergent in this washing performance test.

(1) Prepare the Hucker soil by weighing and adding 0.5 gm. of printer's ink and linseed mixture to the batch of soil. The other constituents of the soil may be measured as previously recommended (*1*) (*2*).

(2) With the motor generator turned on the photometer connected to the battery and the clean slides in the photometer adjust the variable resistance to obtain and I_c meter reading of 40. Then remove the clean slides and obtain the reference reading I_o.[2]

(3) Soil the slides by immersing each of them in a predetermined dilution[3] of the soiling agent so that an I_s reading of 15–20 is obtained after their preparation is completed. After immersion the slides are drained 5–8 minutes vertically and 1–2 minutes horizontally and are baked for one hour at 95° C. As stated earlier (2) the baking temperature and time is critical and must be adhered to exactly if reproducible results are to be obtained. After the slides are baked and cooled the photometer reading, I_s, is made with the same reference, I_o, obtained on that set of clean slides.

(4) Place the soiled slides (I_s, 15–20) in the slide holder of the washing machine, fill the washing jar with 0.3 percent detergent solution which has been heated to 60° C. (140° F.) to ¾ inches above the washing head.

(5) Wash for 3 minutes, using a stop watch to obtain the exact washing time.

(6) Remove the detergent washing jar and the excess solution by running the machine for 10 cycles (about 5–6 seconds) with an empty container in place of the washing jar.

(7) Replace the detergent solution with boiling tap water and rinse by running the machine for exactly 2 minutes, timed by stop watch.

(8) Remove the excess rinse water as in No. 6.

(9) Remove the slides to a drying box or rack and permit them to air dry for 15 to 20 minutes at room temperature. Then make the I_w reading with the washed slides in the photometer and with the photometer adjusted to the same I_o reading as for the clean and soiled slides.

(10) Calculate the percentage of soil removed by substituting the logarithms of the proper transmittancy readings in equation 2,

$$R=\frac{\log I_w-\log I_s}{\log I_c-\log I_s}\times 100.$$

If densities are used instead of transmission readings ($D=2-\log T$) a direct arithmetic calculation may be made

$$\left(R=\frac{D_w-D_s}{D_c-D_s}\times 100.\right)$$

(11) Four tests as described using six slides in each test should be made with slides soiled at different times. The results of the four tests calculated as in 10 should be averaged to give a representative washing efficiency rating for a detergent.

The materials used in the preparation of the standard Hucker soil may vary somewhat so the I_s reading obtained in (3) may not fall between 15–20. Consequently it would be advisable to make washing performance tests with borax and castile soap solutions on all batches of soil. In these tests the soil solution should be so adjusted that a 0.3 percent solution of borax will give removals by the above technique of 10.±5 percent and a 0.3 percent solution of castile soap (in a relatively soft water) will give removals of 94±4 percent. The viscosity of the soil dilutions used to get those results should be observed and future dilutions of the same viscosity should be prepared of the same batch of soil for tests on other detergents. If the percentage of soil removal with these two detergents are beyond the ranges given above and all instructions have been carefully followed the soil densities are either too high or too low and the soil dilution for dipping the slides must be readjusted.

---

[2] It has been found that a Lumentron colorimeter can be easily adapted for this test. If such an instrument is used I_c, I_o and other readings will have different values than are given here.

[3] The proper soil dilution may be determined by making I_s readings on slides dipped in three or more dilutions of the soil and prepared as above. The diluted soiling agent should be strained through one layer of cheese cloth to remove large particles before it is used. The I_s reading is found to be proportional to the concentration of soil. Consequently the results obtained for the different dilutions may be plotted and the dilution required to give the desired I_s reading may be determined graphically. The proper dilution may be easily controlled by means of viscosity measurements. In this laboratory a dilution of 27 percent soil in distilled water which gave a viscosity of 61–62 seconds at 35° C determined in a Saybolt viscosimeter was found to give the required I_s reading.

If tests are to be made on a series of unknown detergents it would be advisable to make a test or two with these reference detergents during the work to make sure that the soil density is such that results in the proper percentage removal range will be obtained throughout. Reference results for five of the common alkaline detergents are given in table 2 column 4 under the I_s reading 15–20. These data show a performance range from about 11 percent for borax to 94 percent for castile soap.

SUMMARY

The washing performance test procedure proposed by Mann and Ruchhoft (*1*) was studied using a number of detergents to determine possible factors causing variations in the results. It was found that the principal difficulty in the test was caused by variations in the soil thickness on the slides. The data obtained showed that the percentage of soil removed by a detergent under the conditions of the test was a function of soil thickness. The original technique proposed for soiling the slides did not permit the careful control of the soil thickness needed for the test. A new procedure for soiling slides depending upon dipping the slides into a soil dilution of known viscosity was developed which permitted the soil densities to be controlled so as to give light transmittancy readings within a definite zone. Control of the soiled slide densities to a definite range in this matter reduced the standard deviation and coefficient of variation in series of tests on all detergents studied and permitted control of reproducibility and range of performance scale. It was shown that under the conditions of the test the transmitted light readings of the washed slides, I_w were relatively constant for each detergent and were independent of soil thickness. On the basis of this fact estimations of washing performance for a detergent can be made from the washed slide readings only with a standardized technique. A curve for estimating washing efficiency from the washed slide readings is presented.

The method of calculating the percentage of soil removed from four transmittancy readings was made to conform to Lambert's law and a simple formula for making this computation was presented. It was shown that this method of calculation also decreased the variation in a series of performance tests.

Possible errors in the test due to darkening of the light bulb in the photometer with age, and the possibility of variations in the Hucker soil are pointed out and improvements in technique to compensate for these factors are given.

A detailed improved procedure which permits the control of the test to the proper performance range for a series of reference detergents and increases the reproducibility of the results for all detergents is presented.

REFERENCES

(*1*) Mann, Edward H., and Ruchhoft, C. C.: A Performance Test for Rating Dishwashing Detergents. Pub. Health Rep. 61:877–887 (June 14), 1946.
(*2*) Hucker, G. J.: Progress Report on Detergent Evaluation Investigation, New York Agricultural Experiment Station (April 1, 1942–March 1), 1943.
(*3*) Van der Werth, A.: Determination of the Cleansing Power of Washing Agents. Allgemeine Oel-und Fett-Zeitung. **30:** 338–94 (1933); Chemical Abstracts 28, 2209 (1934).
(*4*) Tyutyunnikov, B.: Properties of Soap Solutions. I. Estimation of Detergent Capacity, Allgemeine Oel-und Fett-Zeitung. **27:** 241–3 (1930); Chemical Abstracts 25, 2317 (1931).
(*5*) Boutaric, A., and Perreau, G.: The Possibility of Modifying at Will the Sign of the Electrical Charge on Colloids, Compt. rend., **184:**814–16 (1927); Chemical Abstracts 21, 2086 (1927).
(*6*) Creighton, H. Jermain: Principles and Application of Electrochemistry; Volume I—Principles. New York, John Wiley and Sons, Inc., 1943–44, p. 161.

STUDIES IN ENTEROCOCCAL FOOD POISONING

I. The Isolation of Enterococci from Foods Implicated in Several Outbreaks of Food Poisoning

By L. Buchbinder, A. G. Osler, and G. I. Steffen [1]

INTRODUCTION

The ability of non-hemolytic streptococci to produce food poisoning in man does not seem to be a matter of dispute. A number of outbreaks have been reported in which members of this group have been implicated (*1*). Although the specific type of the streptococcus isolated has not always been determined (*2*) it is of interest that, apart from three outbreaks reported (*3*), when attempts have been made to identify the causative agent, an enterococcus, usually *Streptococcus faecalis*, has been implicated.

While the disease producing potentialities of the enterococci have long been recognized (*4*) evidence for the etiological relationship of these intestinal streptococci to outbreaks of food poisoning has been relatively limited. Thus Linden, Turner, and Thom in 1926 (*5*) reported the isolation of non-hemolytic streptococci from two food poisoning outbreaks caused by cheese. The organism in each case produced experimental diarrhea in cats. One of these strains was identified by Sherman, Smiley, and Niven in 1943 (*6*) as *Streptococcus faecalis*. In 1934 Jordan and Burrows (*7*) recorded the isolation of an alpha streptococcus from a cocoanut cream pie filling which caused food poisoning. The organism, which produced filtrates toxic to monkeys, was identified as *Streptococcus faecalis* on the basis of carbohydrate fermentations. The authors found that culture filtrates prepared from "greening streptococci" isolated from other sources were not toxic for monkeys. The question of the toxicity of streptococcus culture filtrates is a matter of dispute and has been reviewed by Dolman (*8*). Dewberry in 1943 (*9*) refers to a food poisoning outbreak caused by canned tomatoes in which a heat resistant streptococcus of "the faecalis type" was present in great abundance and almost in pure culture. Sherman and others (*10*), in a retrospective study, found that a total of six strains of non-hemolytic streptococci isolated by others from an equal number of outbreaks were all *Streptococcus faecalis.* The present authors have identified as *Streptococcus faecalis* an alpha streptococcus isolated in 1939, from turkey dressing by Dack.[2] It was also observed by Sherman and his collaborators that almost any laboratory strain of *Streptococcus faecalis* or of other enterococci could produce diarrhea when fed in pure culture to cats whereas other varieties of non-hemolytic streptococci did not do so. The outbreaks reported in the present paper as well as the demonstration of experimental enterococcal food poisoning in man (*11*) tend to substantiate this evidence for the etiological role of enterococci in food poisoning outbreaks.

---

[1] From the Bureau of Laboratories, Department of Health, New York City.

This paper describes the bacteriological findings and presents other pertinent data in four outbreaks of food poisoning in each of which enterococci were the predominant organisms isolated from the suspected foods. The offending foods were canned evaporated milk, charlotte russe, roast beef, and ham bologna.

STUDY OF CANNED EVAPORATED MILK IMPLICATED IN AN OUTBREAK OF GASTROENTERITIS

Description of outbreak and clinical findings.—An outbreak of mild gastroenteritis affecting 74 individuals occurred in a children's institution following a meal in which 161 persons participated. The illness, which started within 2 to 7 hours after the meal, was characterized mainly by abdominal cramps, nausea and vomiting. Diarrhea was reported in only two cases. All persons were symptom-free within 6 hours after onset.

Implicated foods.—The only foods eaten in common by all 74 individuals who became ill were mashed potatoes and pasteurized milk. The possibility of solanin poisoning was ruled out by chemical examination of the raw and mashed potatoes which revealed normal values. Canned evaporated milk which had been used in the preparation of the mashed potatoes was suspected as the vehicle of this outbreak.

Bacteriological findings.—Inspection of cans from the implicated lot of evaporated milk revealed many rusted, defective cans such as leakers, springers and swells. Previously unopened cans of milk from this lot were studied using the procedures described in Standard Methods for the Examination of Dairy Products,[3] for the examination of canned evaporated milk, except that the cans did not receive preliminary incubation for 1 week at 37° C. Duplicate sets of all dilution plates were prepared. One set was incubated at 37° C. and the other at 55° C.

---

[2] This strain was obtained through the courtesy of Dr. M. J. Surgalla of the University of Chicago.

[3] Eighth edition p. 162-164.

The findings obtained with the milk samples incubated at 55° C. were essentially negative. Only occasional colonies of a thermophilic micrococcus were present. The bacterial counts obtained after incubation at 37° C. are summarized in table 1. Evaporated milk which has been properly processed and stored is usually sterile. Occasionally, when bacterial colonies are found, they number less than 10 per ml. As the table indicates, this condition of so-called commercial sterility was present in only 6 of the 43 cans examined. Of the 43 cans, 24 yielded bacterial counts of more than 100 per ml. of which 12 showed no grossly obvious abnormality of the can or the contents. It is noted that nine of the cans, including two which were normal in gross appearance, contained more than one million organisms per ml. These data seem to indicate that under certain, probably rare conditions, evaporated milk poor in sanitary quality may reach the consumer in normal-appearing cans.[4] The abnormal-appearing cans showed evidence of leakage, swelling and rusting, usually with accompanying changes in the appearance and odor of the milk.

TABLE 1.—*Bacterial counts of 43 cans of evaporated milk from a batch implicated in a food poisoning outbreak*

External appearance of can	Number of cans	Number of cans with bacterial counts per ml. of—				
		0-10	11-100	101-1,000	1,001 to 1 million	More than 1 million
Normal	27	4	11	7	3	2
Abnormal	16	2	2	3	2	7

Additional studies were made of the contents of 12 of the cans included in table 1 in an effort to identify the contaminating organisms. The findings are summarized in table 2. None of the usual food poisoning organisms were encountered. Members of the genera *Shigella*, *Salmonella* and *Clostridium* were absent, as was also *Staphylococcus aureus*. The cans generally yielded the same types of organisms, the difference between the normal-appearing and spoiled cans being mainly quantitative. The organism most frequently present (9 of 12 cans) and in overwhelming preponderance was a short-chained streptococcus subsequently identified as *Streptococcus faecalis*. Three of the cans yielded a pure culture of this enterococcus.

---

[4] Some canned evaporated milk was selected at random from retail stores and similarly examined as a means of checking conformance with Standard Methods. Thirty cans representing 14 different brands were studied. Twenty of these were sterile. The remainder showed fewer than ten organisms per ml. This is what is ordinarily found when canned evaporated milk has been properly processed and stored.

TABLE 2.—*Detailed analysis of findings on 12 cans of evaporated milk from a batch implicated in a food poisoning outbreak*

Laboratory No.	Appearance of can	Appearance of contents	Bacterial count per ml.	Number of colonies studied	Identity of colonies			
					Strept. faecalis	Thermophilic micrococci	Other strept.	Miscellaneous
34	Springer and leaker.	Putrid cheesy odor	100,000,000	9	8	1	0	0
36	Swell	Gassy with sour odor	100,000,000	7	6	1	0	0
31	Normal	Normal	Approximately 1,500	3	2	1	0	0
32	do	do	20	2	0	1	0	1
33	do	do	30	2	0	0	0	2
35	do	do	45,000	6	3	1	2	0
37	do	Sl. thickened	36,000	4	4	0	0	0
2	Swell	Gassy and sl. sour	100,000,000	5	5	0	0	0
27	Dented	Normal	Approximately 400	5	0	0	5	0
44	Rim sl. rusted	do	100	6	4	0	2	0
41	Rim sl. dented	do	Approximately 400	12	11	0	1	0
79	Swell	Gassy with cheesy odor	500,000,000	6	6	0	0	0

Identification of the predominant organism as *Streptococcus faecalis* was based on a study of 49 strains which exhibited the following characteristics:[5]

> The organism appears as a gram positive, somewhat elongated diplococcus or short-chained streptococcus which produces greening on streaked and in poured sheep's blood agar plates. Milk is acidified and then coagulated. Growth of this streptococcus is readily apparent at 10° C. and at 45° C. Active multiplication proceeds in the presence of 6.5 percent NaCl and of 0.1 percent methylene blue. Gelatin is not liquefied. Exposure to 60° C. for 30 minutes does not completely destroy this streptococcus. Acid without gas is produced from mannite, arabinose, maltose, mannose, amygdalin, trehalose, fructose, galactose, lactose, salicin, sucrose, glycerol. In 1 percent glucose broth, the pH is lowered to 4.6 or less in 3 days. Delayed fermentation of rhamnose and dextrin may occur. Inulin, inositol, dulicitol, adonitol, erythritol, sorbitol, xylose, and raffinose are not fermented.

Inoculation of cans with Streptococcus faecalis.—Experimental inoculation of canned evaporated milk with a pure culture of *Streptococcus faecalis* isolated from a can, followed by incubation at 37° C., gave additional evidence that poor handling may have played a role in initiating the spoilage. It was found that within 24 hours following the introduction of as few as 20 organisms, the resealed cans showed definite bulging at the ends. Gas production was noticed upon opening the cans and plate counts indicated a rapid multiplication of the streptococci. In 1927 Hammer (*12*) isolated a streptococcus from a can of evaporated milk which had bulging ends. He named this organism *Streptococcus distendens*. Hammer found that inoculation of normal cans with this strain and subsequent incubation produced similar swelling. This organism, according to Hammer's description, may be interpreted to have been an enterococcus.

---

[5] We are indebted to Dr. James M. Sherman of Cornell University who studied six of these strains and also identified them as *Streptococcus faecalis*.

Another perhaps pertinent observation is that of Baumgartner (*13*) who stated in a discussion of canned foods that:

> "In the problem of post-process leakage, however, non-gas forming organisms such as staphylococci and streptococci may assume a greater significance in relation to canned food-poisoning. The ubiquity of these organisms makes it possible that occasional cans may become infected and intoxicated without apparent signs of spoilage. According to Davison and Dack (1942), commercial experience is that contamination after processing involves gaseous spoilage. While it is true that in the normal way, the majority of leaky cans are eliminated as "swells" it seems unreasonable to assume that gas-forming bacteria must of necessity be present among the invading bacteria. If staphylococcal or streptococcal species effect entrance unaccompanied by gas-forming bacteria the can will not "swell" and the contents may appear normal in spite of extensive development of the organisms. In view of the ability of organisms of this type to form enterotoxic substances, it seems possible that some of the earlier cases of canned food poisoning, where, in the absence of living organisms of the Salmonella group, the causal agent was considered to be heat stable toxin may have been due to contamination with such organisms as staphylococci and streptococci after processing."

The canned milk involved in the present outbreak had been manufactured about 2 years prior to its use and the deterioration which occurred was undoubtedly influenced, if not entirely caused, by careless post-production handling to which it was subjected during the wartime period.

STUDY OF CHARLOTTE RUSSE IMPLICATED IN AN OUTBREAK OF FOOD POISONING

Description of outbreak, clinical findings, and implicated food.—All three members of a family became ill within 5½ to 12 hours after a meal. The symptoms consisted of abdominal cramps, vomiting, and diarrhea. Charlotte russe (sponge cake topped with a simulated whipped cream) was the only food eaten in common which was suspected on epidemiological grounds.

Bacteriological findings.—Specimens of sponge cake, "whipped cream," skimmed condensed milk from a 40-quart can, and gelatin, all of which were used in the preparation of this product were obtained from the baker's premises and were studied with the following results:

Sponge cake.—The bacterial count was 800 per gram and consisted almost entirely of coliform organisms.

Gelatin.—This product yielded a total count of 3×10^5 organisms per gram with a highly varied flora including some 4,000 coliform organisms per gram.[6]

Prior to its use in the pastry, the gelatin is heated in a double boiler for 15–18 hours. Its possible role in this outbreak is therefore minimized by the prolonged heat treatment. Moreover, bacteriological analysis of the whipped cream containing the gelatin revealed entirely different findings.

---

[6] Total counts were obtained by use of Standard T. G. E. M. agar. Coliform counts were obtained by use of Desoxycholate agar. See Standard Methods for the Examination of Dairy Products, 8th edition, pp. 23 and 79.

Skimmed condensed milk.—This product obtained from the bakery premises yielded a total count of 54,000 organisms per ml. and a coliform density of 2 per ml. Blood agar plates[7] prepared with dilutions of this milk revealed a seemingly pure culture of alpha streptococci. Six colonies were selected for identification. All six were found to be enterococci, three being *Streptococcus liquefaciens* and three *Streptococcus faecalis.*

Whipped cream.—This product yielded a total count of 1×10⁷ organisms per gram and a coliform density of but 20 per gram. Here, too, alpha streptococci were predominant on the blood plates, being present almost in pure culture. The finding that five of six colonies selected at random for study were *Streptococcus faecalis* suggests that the majority of these streptococci were of this type.

None of the specimens contained any enteric pathogens or *Staphylococcus aureus.*

The above data indicate that enterococci may have been responsible for this food poisoning outbreak. The results of the study of two additional condensed milk samples taken subsequently from the same milk plant which served the bakery are of interest. The total count of each sample was approximately 5×10^7 per ml. with non-hemolytic streptococci in great preponderance on the blood plates. Ten colonies from each sample were studied and all were identified as *Streptococcus faecalis.*

STUDY OF BARBECUED BEEF IMPLICATED IN AN OUTBREAK OF GASTROENTERITIS

Description of outbreak.—This was a large outbreak of mild gastroenteritis suffered by a group of people who had partaken of a wedding anniversary dinner.

Clinical findings.—The incubation period generally was 10 to 12 hours, the extremes being 3 and 15 hours. The symptoms were mainly mild. They consisted of abdominal cramps and diarrhea. A few persons had nausea as well, while an occasional individual also complained of vomiting. Recovery took place in from a few hours to a day or two. Only a few persons consulted a physician. Seventy-four (85 percent) of eighty-seven persons interviewed had become ill.

Implicated foods.—Epidemiological evidence ruled out all food but barbecued beef and the gravy served with it. All but 2 of the 74 persons affected had eaten the beef and these 2 had partaken of the gravy. The meat had been roasted over hickory logs on the evening (January 5) before it was consumed. It was left unrefrigerated in the roasting room of the delicatessen establishment from 10:30 p. m. until 11 a. m. the following morning. About 50 pounds of it were then sliced and taken to a synagogue where it remained unrefrigerated until 3 p. m. At that time the meat was placed in pans and heated in a slow oven for 1 hour. The meat was consumed between 4 and 5 p. m. The gravy which was composed of turkey and chicken drippings had been collected on January 4 and refrigerated until 11 a. m. January 6. It was warmed between 3 and 4 p. m. and served with the meat.

---

[7] Todd Hewitt Agar and Sheep's Blood.

Bacteriological findings.—Samples of the beef and of the gravy, both of which had been refrigerated after the dinner, were obtained on the day following the outbreak. Routine qualitative tests for staphylococci, shigellae, and salmonellae were negative. Tests for enterococci, however, were positive. Quantitative examinations were carried out as follows:

Ten grams of the meat were weighted aseptically, added to 90 cc. of sterile water and macerated in a blending machine for about 5 minutes. The material was then plated out in decimal dilutions in sodium azide agar[8] and incubated overnight. A count of the sodium azide plates revealed a content of about 4.5×10^6 organisms per gram of beef. Twenty colonies from these plates were picked at random, smeared, and stained. It was found that 18 were gram positive diplococci (streptococci), 1 was a gram-negative rod and 1 a gram positive diphtheroid. Twenty-four colonies were fished directly into tubes of nutrient broth. The tubes were held in a waterbath at 60°–61° C. for 30 minutes and then incubated overnight. Streptococci grew in 18 of the tubes. Each of these cultures was then inoculated into test media to determine whether it fulfilled Sherman's criteria for enterococci (*15*). It was found that 17 of the cultures in addition to resisting 60° C. for 30 minutes, grew well in 24 hours at both 10° C. and 45° C., grew in 6.5 percent NaCl nutrient broth and 0.1 percent methylene blue milk, reduced and coagulated Andrade milk, and did not liquefy 20 percent gelatin infusion broth. The eighteenth culture acted in the same fashion except that it liquefied gelatin and digested milk. Thus, 17 of the 24 cultures isolated can be classified as *Streptococcus faecalis* and the eighteenth as *Streptococcus liquefaciens*. If the assumptions are made that 75 percent ± 18 percent (2σ) of the colonies were enterococci, that no appreciable growth in the meat occurred before bacteriological examination, and that the minimum amount of meat eaten per person was about 100 grams (there were actually 50 pounds of meat for 100 persons or more than 200 grams per person), then as many as 2.5×10^8 to 4.0×10^8 organisms could have been ingested per person. This finding is impressive even though the calculation is based on admittedly crude data.

The gravy yielded a count on sodium azide plates of about 3×10^5 organisms per ml. Thirteen of twenty-four colonies picked from these plates and tested as described above were found to be *Streptococcus faecalis*. Thus the *Streptococcus faecalis* count of the gravy was about 1×10^5 to 2.4×10^5 per ml.

STUDY OF HAM BOLOGNA IN AN OUTBREAK OF GASTROENTERITIS

Description of outbreak and implicated food.—Three small outbreaks of gastroenteritis in which the suspected food was ham bologna occurred within short time intervals of each other. It was ascertained that the ham bolognas were all part of one shipment which had been distributed by a large chain retail grocery company to a number of its stores in the metropolitan area. The company had been notified of additional outbreaks occurring outside of the city and had recalled all of the meat.

---

[8] The medium used, except for omission of one ingredient, was that described by White and Sherman (*14*) for the quantitative isolation of enterococci from milk. The omitted substance was penicillin which in our hands was found to be too inhibitory for strains of *Streptococcus faecalis*. The formula which was used follows: 0.5 percent glucose, 0.5 percent tryptone, 0.5 percent yeast extract (Standard Brands), 1.5 percent agar, and 0.03 percent sodium azide.

Clinical findings.—Nine persons in three families ate the ham bologna and all nine became ill. The symptoms began in 3 to 6 hours and lasted from 3 to 48 hours. They consisted of vomiting, abdominal cramps, and diarrhea. The symptoms on the whole were slightly more severe than those in the three previously described outbreaks.

Bacteriological findings.—Samples of the ham bologna from the three outbreaks were negative for the genera *Shigella* and *Salmonella.* No Staphylococci of the food poisoning type were found in samples from any of the three outbreaks. A sample from only one of the three outbreaks was studied for enterococci. The technic used for isolation and identification of the enterococci was the same as that described for the roast beef outbreak. A count which indicated the presence of 3.5×10^6 organisms per gram of meat was obtained from the sodium azide plates. Seventy-six colonies were cultured in broth. All of these apparently were enterococci by Sherman's criteria. Seventy-two qualified as *Streptococcus faecalis* and 4 as *Streptococcus liquefaciens.* Thus, if the portion eaten is estimated as 100 grams the dose might be 3.5×10^8, which is very similar to that found for the roast beef outbreak.

DISCUSSION

The general impression formed by a study of the literature and the outbreaks reported here is that food poisoning may be more commonly caused by enteric streptococci than has been hitherto believed. It is thus somewhat surprising that enterococci have not been more frequently implicated in outbreaks of bacterial food poisoning since they can be readily isolated from raw and pasteurized milk (*14*) as well as from green Swiss cheese (*16*). They are also found on human hands[9] and are the most abundant streptococci of human feces (*17*), and in addition, grow at refrigerator temperatures. There are, however, several possible explanations for this fact:

1. There might be the inclination to regard *Streptococcus faecalis* as a saprophytic organism whose presence in suspected foods is considered of little significance.
2. There is an apparent tendency, indicated by study of reports submitted to the United States Public Health Service, to implicate the staphylococcus as the only possible remaining cause in those outbreaks where known enteric pathogens are not isolated.
3. In those instances where bacteriological study of a food poisoning outbreak is limited to a search for the well known enteric pathogens

---

[9] Examination of the hands of 23 persons revealed that those of 7 carried enterococci (*18*).

and the staphylococci, absence of these etiological agents often automatically leads to a designation of the outbreak as one of unknown etiology.

4. The failure to use a fairly rigid quantitative technic in the isolation of bacteria from suspected foods may result in misinterpretation of the significance of those organisms which are actually recovered.

5. As may be inferred from (*11*), it is probable that persons rarely ingest the very large number of enterococci necessary to produce gastroenteritis.

SUMMARY

Evidence is presented which implicates enterococci as the possible causative organisms in four outbreaks of food poisoning of a relatively mild type. The implicated foods were milk products or meats. They were canned evaporated milk, charlotte russe, barbecued beef, and ham bologna.

The literature on the subject of streptococcal food poisoning is briefly reviewed and the possibility of occurrence of similar outbreaks mistakenly ascribed to other or unknown etiological agents is discussed.

ACKNOWLEDGMENT

We are indebted to Drs. Samuel Frant, Morris Greenberg, and William Birnkrant of the Bureau of Preventable Diseases for the epidemiological data and to Mr. Joseph Schiftner of the Bureau of Food and Drugs for the food samples and related information.

We also wish to acknowledge the assistance of Miss Elizabeth Dillon of this Laboratory in the study of the canned milk outbreak.

REFERENCES

(*1*) Disease outbreaks conveyed through foods, milk and milk products in the United States in 1943. U. S. Public Health Service, Division of Sanitary Engineering, Federal Security Agency.

(*2*) Cary, W. E., Dack, G. M., and Meyers, E.: An institutional outbreak of food poisoning possibly due to a streptococcus. Proc. Soc. Exper. Biol. & Med. **29:** 214 (1931).

Cary, W. E., Dack, G. M., and Davison, E.: Alpha type streptococci in food poisoning. J. Infect. Dis. **62:** 88 (1938).

Dack, G. M.: Food poisoning. Chicago, University of Chicago Press, 1943, Chapter VII.

(*3*) Getting, V. A., Rubenstein, A. D., and Foley, G. E.: Staphylococcus and streptococcus carriers. Sources of food-borne outbreaks in war industry. Am. J. Pub. Health **34:** 833 (1944).

(*4*) Rantz, L. A. and Kirby, W. N. M.: Enterococcic infections. Arch. Int. Med. **71:** 516 (1943).

Andrewes, F. W., and Horder, T. J.: A study of the streptococci pathogenic for man. Lancet **2:** 708, 713 (1906).

Dible, J. H.: The enterococcus and the fecal streptococci (their properties and relations). J. Path. and Bact. **24:** 3 (1921).

Porch, M. L.: A bacteriological study of streptococci isolated from the genito-urinary tract. J. Bact. **41:** 485 (1941).

(*5*) Linden, B. A., Turner, W. R., and Thom, C.: Food poisoning from a streptococcus in cheese. Pub. Health Rep. **41:** 1647 (1926).

(*6*) Sherman, J. M., Smiley, K. L., and Niven, C. F., Jr.: The identity of a streptococcus associated with food poisoning from cheese. J. Dairy Sci. **26**: 321 (1943).

(*7*) Jordan, E. O. and Burrows, W.: Streptococcus food poisoning. J. Infect. Dis. **55**: 363 (1934).

(*8*) Dolman, C. E.: Bacterial food poisoning. Canad. J. Pub. Health **34**: 97, 205 (1943).

(*9*) Dewberry, E. B.: Food poisoning. London, Leonard Hill Limited, 1943, page 23.

(*10*) Sherman, J. M., Gunsalus, I. C., and Bellamy, W. D.: Streptococcus food poisoning. 57th Annual Report, N. Y. Stat Col. Agr., Cornell University Agr. Exp. Sta. (1944).

(*11*) Osler, A. G., Buchbinder, L., and Steffen, G. I.: Studies in enterococcal food poisoning. II. Experimental Food Poisoning in Man. (To be published in Pub. Health Rep.).

(*12*) Hammer, B. W.: Gas in evaporated milk due to a streptococcus. Iowa State College Jour. of Sci. **2**: 5, 7 (1927).

(*13*) Baumgartner, J. G.: Canned foods—an introduction to their microbiology. London, J. & A. Churchill, Ltd., 1943, p. 117.

(*14*) White, J. C., and Sherman, J. M.: Occurrence of enterococci in milk. J. Bact. **48**: 262 (1944).

(*15*) Sherman, J. M.: The streptococci. Bact. Rev. **1**: 1 (1937).

(*16*) Sherman, J. M., and Stark, P.: Streptococci which grow at high temperatures. J. Bact. **22**: 275 (1931).

(*17*) Smith, F. R. and Sherman, J. M.: The hemolytic streptococci of human feces. J. Infect. Dis. **62**: 186 (1938).

(*18*) Alff, E. C. and Buchbinder, L.: Unpublished Observations.

COURT DECISION ON PUBLIC HEALTH

Compulsory pasteurization of milk upheld.—The power of a city to require the pasteurization of milk has been upheld in a number of court decisions. Tobey[1] cites pertinent decisions of State courts of last resort. Recently, when the compulsory pasteurization ordinance of Atlanta, Ga., was challenged, Superior Court Judge E. E. Andrews' decision upheld the pasteurization law, and no appeal to a higher court has been made.

Abstract.—(Fulton Superior Court; *F. H. Neely et al.* v. *City of Atlanta, Ga.*, No. A–1323, decided August 26, 1947):

1. The court finds that the ordinance of the city of Atlanta providing that "No fluid milk shall be sold to the ultimate consumer except grade "A" pasteurized milk or certified milk pasteurized" is not oppressive, burdensome, arbitrary, and unreasonable or unconstitutional. Public Health Bulletin No. 220 containing the Milk Ordinance and Code recommended and approved by the U. S. Public Health Service and the U. S. Department of Agriculture, which was admitted in evidence, contains the following:

"The public health value of pasteurization is unanimously agreed upon by health officials. Long experience shows conclusively its value in the prevention of diseases which may be transmitted through milk. Pasteurization is the only measure known which if properly applied to all milk will prevent all milk-borne diseases. Examination of cows and milk handlers, while desirable and of great value, can be done at intervals only and, therefore, may permit pathogenic bacteria to enter the milk for varying periods before the disease condition is discovered. * * * Numerous studies and observations clearly prove that the food value of milk is not impaired by pasteurization."

---

[1] Tobey, James A.: Legal aspects of milk sanitation, ed 2, Washington, D. C., Milk Industry Foundation, 1947.

Section 42–401 of the Georgia Code of 1933 provides "* * * the standards recognized and approved by the U. S. Department of Agriculture for * * * milk and milk products shall be adopted as far as practicable * * *."

2. The charter of the city of Atlanta confers upon the mayor and general council all powers over matters respecting the health of the city and said milk ordinance is a valid exercise of the police power of the city of Atlanta, enacted in the interest of the public health unless—

(a) The State legislature has preempted unto itself the legislative field over milk control or

(b) Said city ordinance is in conflict with the statutes of the State.

The State Milk Control Act does not expressly prohibit the enactment of additional local requirements by municipalities in keeping with the purpose of the general law. The State has not so completely occupied the legislative field of milk control as to render any ordinance by the city of Atlanta on the subject inconsistent with the State act. The city of Atlanta, under its general police power over public health may make such new and additional regulations of milk control in aid and furtherance of the purposes of the general law as may seem fit unless in conflict with the State statutes.

The court is of the opinion that the city of Atlanta is not prohibited from enacting the ordinance in question which provides a higher standard of safety for the protection of public health than is provided by the State statutes.

The court finds that said ordinance is not in conflict with the State law or with the rules and regulations formulated by the State commissioner of agriculture which define milk, grade "A" raw milk, pasteurized milk, sterilized milk, cream, buttermilk, etc., but do not expressly permit the sale of any of them in the State of Georgia.

The ordinance of the city of Atlanta fixes a higher standard of safety for milk than does the State law or the rules and regulations promulgated by the commissioner of agriculture but it does not conflict with said rules and regulations or with the State law.

3. Whereupon it is considered ordered and adjudged that the ordinance providing that no fluid milk shall be sold to the ultimate consumer except grade "A" pasteurized milk or certified milk pasteurized is a valid and enforceable ordinance of the city of Atlanta.

The decree was signed by E. E. Andrews, judge, superior court, Atlanta Judicial Circuit.

INCIDENCE OF DISEASE

No health department, State, or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JANUARY 3, 1948

Summary

The incidence of influenza increased from 3,835 to 7,315 cases for the current week, as compared with 3,665 for the same week last year and a 5-year (1943–47) median of 4,587. The increase is accounted for chiefly in the reports of 10 States with 94 percent of the total, as follows (last week's figures in parentheses): Virginia 839 (419), West Virginia 152 (76), South Carolina 1,350 (357), Tennessee 130 (59), Arkansas 212 (44), Louisiana 150 (1), Oklahoma 195 (180), Texas 2,966 (2,015), Arizona 601 (197), California 315 (131). Only 3 other States (Alabama, 83, Colorado, 85, and Oregon, 64) reported more than 24 cases. The total since July 26 (approximate average seasonal low incidence date) is 44,011, as compared with a 5-year median of 36,640, and more than 400,000 each for the corresponding periods of 1943 and 1945.

The total of 46 cases of poliomyelitis reported for the week (last week 61, same week last year 79, 5-year median 52), is less than reported for a corresponding week since 1944 (34 cases). The largest numbers reported currently were 5 cases in California and 4 each in Minnesota and Utah. The total for the 42-week period since March 15 (average low incidence date) is 10,231, as compared with 24,876 for the corresponding period last year and a 5-year median of 13,394.

No occurrence of smallpox was reported for the week. One case of psittacosis was reported, in California. Of 6 cases of Rocky Mountain spotted fever 4 were reported in North Carolina and 1 each in Maryland and Oklahoma. The total of 574 cases of this disease for the 53-week period is the same as for the same period last year and more than for any other corresponding period of the past 8 years. Above the corresponding 5-year medians for the 53-week period are the cumulative figures for the dysenteries (combined), infectious encephalitis, Rocky Mountain spotted fever, tularemia, undulant fever (2-year average), and whooping cough.

A total of 10,418 deaths was recorded for the week in 93 large cities of the United States, as compared with 8,891 last week, 10,209 and 11,928, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 10,209. Infant deaths totaled 716, as compared with 649 last week, and a 3-year median of 664.

Telegraphic morbidity reports from State health officers for the week ended January 3, 1948, and comparison with corresponding week of 1947 and 5-year median*

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	Jan. 3, 1948	Jan. 4, 1947		Jan. 3, 1948	Jan. 4, 1947		Jan. 3, 1948	Jan. 4, 1947		Jan. 3, 1948	Jan. 4, 1947	
NEW ENGLAND												
Maine	1	3	0	------	1	1	4	260	25	0	1	2
New Hampshire	0	0	0	------	1	3	------	10	6	0	0	0
Vermont	1	0	0	------	------	24	2	126	18	0	0	0
Massachusetts	5	21	7	------	------	------	177	247	247	0	3	8
Rhode Island	0	0	0	------	------	25	------	16	7	0	0	0
Connecticut	0	0	1	------	2	11	15	84	32	4	0	2
MIDDLE ATLANTIC												
New York	16	25	15	[1] 5	[1] 8	[1] 17	267	112	316	6	4	22
New Jersey	3	4	3	------	4	27	348	120	120	0	1	15
Pennsylvania	7	11	13	(2)	[2] 4	[2] 7	203	778	778	5	1	10
EAST NORTH CENTRAL												
Ohio	15	18	18	7	5	16	251	211	40	3	6	10
Indiana	7	21	13	------	23	31	693	18	38	1	0	4
Illinois	3	3	10	------	4	13	799	23	169	4	6	9
Michigan [3]	0	5	3	------	------	1	369	126	52	2	4	4
Wisconsin	3	4	4	14	33	62	112	77	77	0	2	2
WEST NORTH CENTRAL												
Minnesota	15	9	4	1	------	------	124	6	6	1	0	1
Iowa	1	0	5	------	------	2	92	1	21	1	4	3
Missouri	5	8	3	6	1	6	29	6	24	4	2	7
North Dakota	2	3	3	12	2	25	30	2	1	0	1	1
South Dakota	2	0	1	------	------	------	12	7	10	0	1	1
Nebraska	1	0	4	13	------	60	------	1	12	1	1	1
Kansas	5	3	4	24	30	36	4	4	46	0	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	6	------	2	1	0	0
Maryland [3]	4	14	10	4	5	9	3	10	10	0	0	6
District of Columbia	0	0	0	------	1	5	42	15	9	0	2	2
Virginia	12	3	5	839	615	659	324	86	85	2	1	9
West Virginia	3	12	3	152	65	65	149	22	22	0	6	5
North Carolina	32	8	13	------	------	------	2	160	53	0	2	8
South Carolina	18	18	7	1,350	789	789	13	45	45	0	6	6
Georgia	10	18	13	23	12	181	11	89	19	0	0	2
Florida	10	6	6	16	7	7	13	1	8	1	0	2
EAST SOUTH CENTRAL												
Kentucky	9	21	4	3	3	3	4	------	66	2	2	4
Tennessee	10	16	10	130	22	89	19	8	39	0	1	6
Alabama	2	8	8	83	69	413	8	27	9	1	2	4
Mississippi [3]	5	14	13	24	------	------	5	------	------	1	3	3
WEST SOUTH CENTRAL												
Arkansas	9	1	7	212	53	179	23	13	13	1	1	1
Louisiana	4	18	9	150	3	21	3	11	11	1	1	2
Oklahoma	5	2	5	195	90	171	1	10	10	0	1	3
Texas	31	27	48	2,966	1,431	2,250	541	25	90	4	8	9
MOUNTAIN												
Montana	1	1	1	------	44	44	211	70	38	0	0	0
Idaho	0	1	1	14	19	17	11	4	24	0	0	1
Wyoming	0	0	1	------	14	14	11	2	3	0	0	0
Colorado	2	8	6	85	22	45	20	2	59	0	2	2
New Mexico	4	1	3	1	2	1	------	8	3	1	0	1
Arizona	4	7	3	601	209	209	6	64	7	0	0	1
Utah [3]	2	0	0	6	28	32	19	10	14	0	1	1
Nevada	0	0	0	------	------	------	1	------	4	0	0	0
PACIFIC												
Washington	3	10	10	------	------	------	56	20	25	0	0	2
Oregon	1	3	3	64	25	25	13	29	54	0	0	7
California	9	11	30	315	13	35	256	29	210	14	6	21
Total	282	366	366	7,315	3,665	4,587	5,302	2,995	2,995	61	83	238
53 weeks	12,793	16,560	15,931	345,524	226,837	372,455	221,021	665,967	603,376	3,468	5,721	8,190
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low *	6,496	7,932	8,771	44,011	36,640	36,640	35,519	25,882	28,893	827	1,055	1,695

[1] New York City only. [2] Philadelphia only.

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

*To obtain figures comparable with the 53-week totals for 1947, to each of the 52-week totals for the years 1942–1946 has been added the respective total for the first week of the succeeding year.

Telegraphic morbidity reports from State health officers for the week ended January 3, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	Jan. 3, 1948	Jan. 4, 1947		Jan. 3, 1948	Jan. 4, 1947		Jan. 3, 1948	Jan. 4, 1947		Jan. 3, 1948[5]	Jan. 4, 1947	
NEW ENGLAND												
Maine	0	1	0	24	48	35	0	0	0	0	0	0
New Hampshire	0	1	0	11	7	6	0	0	0	0	0	0
Vermont	0	1	0	2	12	5	0	0	0	1	0	0
Massachusetts	1	0	0	111	144	261	0	0	0	0	3	1
Rhode Island	0	0	0	2	10	12	0	0	0	0	0	0
Connecticut	1	0	0	22	26	49	0	0	0	0	0	1
MIDDLE ATLANTIC												
New York	2	4	4	139	226	329	0	0	0	1	1	2
New Jersey	0	1	1	31	94	76	0	0	0	1	0	0
Pennsylvania	1	3	0	132	113	197	0	0	0	5	2	3
EAST NORTH CENTRAL												
Ohio	3	1	1	234	284	284	0	1	0	0	4	3
Indiana	2	5	1	53	103	103	0	1	1	0	2	1
Illinois	3	2	0	91	129	213	0	0	0	2	1	2
Michigan[3]	0	1	0	93	165	66	0	0	0	5	1	0
Wisconsin	0	13	1	51	69	145	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	4	0	0	43	32	53	0	0	0	0	0	0
Iowa	1	2	0	49	17	53	0	0	0	0	0	0
Missouri	0	2	1	38	35	52	0	0	0	1	0	0
North Dakota	0	0	0	11	6	11	0	0	0	0	0	0
South Dakota	0	1	0	2	16	38	0	0	0	0	1	0
Nebraska	0	1	0	14	10	33	0	0	0	0	0	0
Kansas	0	4	0	12	25	80	0	0	0	0	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	6	6	6	0	0	0	0	0	0
Maryland[3]	0	0	0	13	19	43	0	0	0	1	0	1
District of Columbia	0	0	0	4	4	15	0	0	0	0	0	0
Virginia	0	2	1	24	25	55	0	0	0	2	0	1
West Virginia	1	0	0	27	16	40	0	0	0	0	1	1
North Carolina	[6] 7	3	0	45	37	78	0	0	0	1	1	0
South Carolina	0	0	0	14	26	12	0	0	0	0	1	1
Georgia	0	3	1	26	9	14	0	0	0	1	1	1
Florida	2	1	0	7	10	10	0	0	0	1	0	0
EAST SOUTH CENTRAL												
Kentucky	0	0	0	35	40	40	0	0	0	0	2	1
Tennessee	3	0	0	51	15	49	0	0	0	1	1	1
Alabama	0	1	0	11	19	22	0	0	0	0	0	0
Mississippi[3]	0	1	1	11	4	13	0	1	0	1	1	0
WEST SOUTH CENTRAL												
Arkansas	0	0	1	7	3	6	0	0	0	1	0	1
Louisiana	0	3	1	6	4	10	0	0	0	1	4	2
Oklahoma	0	3	1	15	6	25	0	0	0	1	0	0
Texas	1	3	4	32	26	83	0	0	0	2	1	5
MOUNTAIN												
Montana	0	0	0	13	5	13	0	0	0	0	0	0
Idaho	1	0	0	12	13	13	0	0	1	0	2	0
Wyoming	0	0	0	5	5	7	0	0	0	0	0	0
Colorado	1	2	0	29	30	30	0	0	0	1	1	1
New Mexico	0	0	0	10	6	6	0	0	0	0	0	0
Arizona	0	0	1	14	8	10	0	0	0	0	2	0
Utah[3]	4	1	1	12	20	43	0	0	0	0	0	0
Nevada	0	0	0	1	0	0	0	0	0	0	0	0
PACIFIC												
Washington	3	1	3	21	42	45	0	0	0	0	1	1
Oregon	0	0	0	[7] 10	25	25	0	0	0	2	1	0
California	5	12	10	62	86	203	0	0	0	4	2	1
Total	46	79	52	1,688	2,080	3,457	0	3	8	36	38	40
53 weeks	[6] 10,853	25,343	13,791	[7] 85,019	115,061	143,939	169	336	402	3,930	4,041	5,424
Seasonal low week[4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	[6] 10,241	24,876	13,394	[7] 22,916	28,766	41,778	22	57	95	3,445	3,566	4,608

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately as follows: Vermont 1; New York 1; Michigan 1; Tennessee 1; Colorado 1; Oregon 1.

[6] Correction (deducted from cumulative totals): Poliomyelitis, North Carolina week ended November 8, 9 cases (instead of 10).

[7] Delayed report (included in cumulative totals only): Scarlet fever, Oregon week ended December 13, 31 cases.

Telegraphic morbidity reports from State health officers for the week ended January 3, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended January 3, 1948							
	Week ended—		Median 1943–47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Jan. 8, 1947	Jan. 9, 1946		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	26	14	19								
New Hampshire	4										
Vermont	47	4	17								3
Massachusetts	125	118	118		1						
Rhode Island	12	11	11								
Connecticut	28	10	31								3
MIDDLE ATLANTIC											
New York	85	166	167	8	2		1			1	3
New Jersey	61	94	91						1		
Pennsylvania	76	158	141								2
EAST NORTH CENTRAL											
Ohio	86	86	86						1		2
Indiana	30	15	15				3		1		4
Illinois	35	70	70	1					10		8
Michigan [3]	68	228	43	3							4
Wisconsin	90	134	86								5
WEST NORTH CENTRAL											
Minnesota	37	1	28				1				7
Iowa	12	5	6								2
Missouri	29	11	11								1
North Dakota		1	1								
South Dakota	2	1	1								
Nebraska	2	3	3	1					1		3
Kansas	29	19	22				1		1		
SOUTH ATLANTIC											
Delaware	1	4	4								
Maryland [3]	27	40	40					1	1		1
District of Columbia	10	6	6								
Virginia	89	75	61	1		39			6		
West Virginia	24	10	18								
North Carolina	48	13	71		2		[8] 1	4	9	([8])	2
South Carolina	131	62	63	2	4				1	1	1
Georgia	7	8	8		1				1	3	
Florida	8	9	9			1				2	
EAST SOUTH CENTRAL											
Kentucky	15	46	20						2		
Tennessee	10	9	12	1					2	2	1
Alabama	13	15	15								
Mississippi [3]				2			1		1	1	
WEST SOUTH CENTRAL											
Arkansas	40	23	22	2					2		1
Louisiana	14	1	2	2					1		
Oklahoma	25		5	1		1		1	1		1
Texas	225	139	145	13	306	246			1	3	6
MOUNTAIN											
Montana	12	1	7								
Idaho	14	5	3								
Wyoming	2	1	5						1		
Colorado	80	6	17								8
New Mexico	4	1	2								
Arizona	36	23	22			43	1				
Utah [3]	5	3	12								
Nevada			1								
PACIFIC											
Washington	16	6	21	1							
Oregon	7	12	13	1		1	1				1
California	49	79	98	1	2		2			1	1
Total	1,796	1,746	1,746	40	318	331	12	6	44	14	70
Same week: 1946	1,746			37	322	473	4	1	51	37	86
Median, 1942–46	1,746			22	322	101	6	0	39	67	[9] 63
53 weeks: 1947	155,601			3,054	17,120	10,145	[8] 639	574	1,398	[8] 1,924	6,143
1946	101,958			2,464	17,034	6,960	621	574	1,230	3,388	5,423
Median, 1942–46	124,927			1,995	18,478	7,668	626	455	838	4,592	[9] 5,133

[3] Period ended earlier than Saturday.

[8] Delayed report, North Carolina: Encephalitis, week ended November 8, 1 case, included in cumulative totals only; correction, typhus fever week ended August 16, 1 case (instead of 2), deducted from cumulative totals.

[9] 2-year average, 1945–46.

Psittacosis: California, 1 case.

Alaska, week ended January 3, 1948: Suspected typhoid fever 2; dysentery 1; colds 10; mumps 1; influenza 3.

Territory of Hawaii, week ended Jan. 3, 1948; Leprosy 1; measles 1; paratyphoid fever 1; endemic typhus fever 1; whooping cough 15.

WEEKLY REPORTS FROM CITIES*

City reports for week ended Dec. 27, 1947

This table lists the reports from 85 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	------	0	1	0	3	0	0	7
New Hampshire:												
Concord	0	0	------	0	------	0	3	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	5	0	------	1	33	0	10	0	19	0	1	19
Fall River	0	0	------	0	1	0	1	0	2	0	1	10
Springfield	0	0	1	0	------	0	1	0	3	0	0	4
Worcester	0	0	------	0	1	0	4	0	5	0	0	2
Rhode Island:												
Providence	0	0	------	0	------	0	1	0	2	0	0	14
Connecticut:												
Bridgeport	0	0	------	0	------	0	0	0	3	0	0	1
Hartford	0	0	------	0	------	0	0	0	0	0	0	10
New Haven	0	0	------	0	------	0	2	0	0	0	0	1
MIDDLE ATLANTIC												
New York:												
Buffalo	2	0	------	0	1	0	7	0	7	0	0	15
New York	9	0	3	1	103	0	73	2	35	0	0	15
Rochester	0	0	------	0	------	0	1	1	9	0	0	5
Syracuse	0	0	------	0	------	0	3	0	8	0	0	9
New Jersey:												
Camden	0	0	------	0	------	0	2	0	0	0	0	2
Newark	0	0	------	0	4	0	2	0	5	0	0	3
Trenton	0	0	------	0	------	0	0	0	0	0	0	------
Pennsylvania:												
Philadelphia	5	0	2	1	21	2	24	0	47	0	0	27
Pittsburgh	1	0	------	0	2	0	6	0	9	0	0	5
Reading	0	0	------	1	------	0	1	0	2	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	1	13	1	10	0	8	0	0	2
Cleveland	0	0	3	0	1	1	8	0	28	0	0	9
Columbus	4	0	------	0	24	0	2	0	8	0	0	6
Indiana:												
Indianapolis	0	0	------	0	6	1	4	0	5	0	0	4
South Bend	0	1	------	0	------	0	0	0	1	0	0	------
Illinois:												
Chicago	0	0	1	0	223	2	23	2	25	0	0	14
Michigan:												
Detroit	2	0	------	0	7	0	17	0	24	0	1	18
Flint	0	0	------	0	------	0	2	0	2	0	0	1
Grand Rapids	0	0	0	1	42	0	2	0	4	0	0	3
Wisconsin:												
Kenosha	0	0	------	0	1	0	0	0	1	0	0	------
Milwaukee	0	0	1	1	4	0	3	0	7	0	0	12
Racine	0	0	------	0	1	0	0	0	2	0	0	1
Superior	0	0	------	0	------	0	0	0	1	0	0	5
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	1	0	0	0	6	0	0	8
Minneapolis	0	0	------	0	76	0	4	0	8	0	0	9
St. Paul	2	0	------	0	2	0	4	0	2	0	0	6
Missouri:												
Kansas City	0	0	1	0	1	0	4	0	5	0	0	6
St. Joseph	0	0	------	0	------	0	0	0	0	0	0	------
St. Louis	0	0	2	0	7	0	12	0	11	0	0	2

*In some instances the figures include nonresident cases.

City reports for week ended Dec. 27, 1947—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	0	------	1	4	0	2	0	0	------
Kansas:												
Topeka	0	0	------	0	------	0	1	0	0	0	0	1
Wichita	0	0	------	0	------	0	5	0	2	0	0	1
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	------	0	1	0	6	0	0	------
Maryland:												
Baltimore	2	0	------	0	2	0	4	0	6	0	1	43
Cumberland	2	0	------	0	------	0	0	0	2	0	0	1
Frederick	1	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	1	0	1	0	12	1	11	0	4	0	0	3
Virginia:												
Lynchburg	0	0	------	0	------	0	1	0	2	0	0	3
Richmond	0	0	------	0	------	0	2	0	4	0	0	3
Roanoke	0	0	------	0	------	0	0	0	1	0	0	------
West Virginia:												
Charleston	0	0	------	0	1	0	1	0	0	0	0	------
Wheeling	0	0	------	0	1	0	0	0	1	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	0	0	0	0	0	0	1
Wilmington	0	0	------	0	------	0	0	0	1	0	0	------
Winston-Salem	1	0	------	0	------	0	2	0	3	0	0	------
South Carolina:												
Charleston	0	0	4	0	------	0	2	0	1	0	0	------
Georgia:												
Atlanta	0	0	8	0	------	0	1	0	2	0	0	------
Savannah	0	0	------	0	1	0	0	0	1	0	0	1
Florida:												
Tampa	0	0	------	1	9	0	3	0	1	0	0	3
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	5	0	4	0	6	0	4	0	1	1
Nashville	0	0	------	1	------	0	4	0	1	0	0	------
Alabama:												
Birmingham	0	0	2	0	2	0	3	0	2	0	0	------
Mobile	3	0	11	0	------	0	1	0	1	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	1	0	------	0	0	0	0	0	0	------
Louisiana:												
New Orleans	0	0	1	0	1	1	6	0	1	0	0	------
Shreveport	0	0	------	0	------	0	5	0	1	0	0	------
Oklahoma:												
Oklahoma City	0	0	1	0	------	0	1	0	2	0	0	------
Texas:												
Dallas	0	0	1	1	------	0	1	0	5	0	0	------
Galveston	1	0	------	0	------	0	1	0	0	0	0	------
Houston	0	0	------	0	3	0	6	0	1	0	0	------
San Antonio	1	0	1	1	------	0	3	0	2	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	39	0	2	0	0	0	0	------
Great Falls	0	0	------	0	2	0	0	0	2	0	0	------
Helena	0	0	------	0	------	0	0	0	0	0	0	------
Missoula	0	0	------	0	1	0	0	0	0	0	0	------
Colorado:												
Denver	1	0	1	0	15	1	3	0	5	0	0	10
Pueblo	0	0	------	0	------	0	0	0	5	0	0	11
Utah:												
Salt Lake City	0	0	------	0	3	1	1	1	0	0	0	------
Washington:												
Seattle	0	0	------	0	3	0	2	0	2	0	0	9
Spokane	0	0	------	0	------	0	0	0	1	0	0	------
Tacoma	1	0	------	0	23	0	0	0	1	0	0	------

City reports for week ended Dec. 27, 1947—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC—continued												
California:												
Los Angeles	1	0	61	2	11	0	1	1	17	0	0	9
Sacramento	0	0	------	0	2	0	0	0	0	0	1	------
San Francisco	0	0	4	0	65	0	9	0	7	0	0	3
Total	45	1	116	13	775	12	330	7	401	0	6	359
Corresponding week, 1946[1]	91	------	69	23	628	------	337	------	457	0	10	393
Average 1942-46[1]	79	------	1,608	[2] 51	[3] 1,239	------	[2] 469	------	869	0	9	579

[1] Exclusive of Oklahoma City. [2] 3-year average, 1944-46. [3] 5-year median, 1942-46.

Anthrax.—Cases: Philadelphia 1.
Dysentery, amebic.—Cases: New York 6; St. Louis 1; Los Angeles 1; San Francisco 1.
Dysentery, bacillary.—Cases: Worcester 1.
Dysentery, unspecified.—Cases: New York 17; Baltimore 1; San Antonio 1.
Leprosy.—Cases: New York 1.
Tularemia.—Cases: Cleveland 1; Baltimore 1; Birmingham 1.
Typhus fever, endemic.—Cases: New York 2; Los Angeles 6.

Rates (annual basis) per 100,000 population, by geographic groups, for the 85 cities in the preceding table (latest available estimated population, 34,303,300)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	13.1	0.0	2.6	2.6	91	0.0	60.1	0.0	97	0.0	5.2	178
Middle Atlantic	7.9	0.0	2.3	1.4	61	0.9	55.1	1.4	54	0.0	0.0	38
East North Central	3.8	0.6	3.1	1.9	202	3.1	44.4	1.3	73	0.0	0.6	47
West North Central	4.0	0.0	6.0	0.0	175	2.0	68.4	0.0	72	0.0	0.0	66
South Atlantic	11.5	0.0	21.4	1.6	43	1.6	46.2	0.0	58	0.0	1.6	96
East South Central	17.7	0.0	106.2	5.9	35	0.0	82.6	0.0	47	0.0	5.9	6
West South Central	5.1	0.0	12.7	5.1	10	2.5	58.4	0.0	30	0.0	0.0	0
Mountain	8.3	0.0	8.3	0.0	496	16.5	49.6	8.3	99	0.0	0.0	173
Pacific	3.2	0.0	102.8	3.2	164	0.0	19.0	1.6	44	0.0	1.6	33
Total	6.9	0.2	17.7	2.0	118	1.8	50.3	1.1	61	0.0	0.9	55

DEATHS DURING WEEK ENDED DECEMBER 27, 1947

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Dec. 27, 1947	Corresponding week, 1946
Data for 93 large cities of the United States:		
Total deaths	8,891	9,380
Median for 3 prior years	9,934	------
Total deaths, first 52 weeks of year	478,066	470,184
Deaths under 1 year of age	646	721
Median for 3 prior years	608	------
Deaths under 1 year of age, first 52 weeks of year	37,892	34,936
Data from industrial insurance companies:		
Policies in force	66,935,951	67,278,078
Number of death claims	8,896	9,065
Death claims per 1,000 policies in force, annual rate	6.9	7.0
Death claims per 1,000 policies, first 52 weeks of year, annual rate	9.2	9.3

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended December 13, 1947.—During the week ended December 13, 1947, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		40	4	274	306	83	74	71	86	938
Diphtheria		2		37	9			4	6	58
Encephalitis, infectious								1	1	2
German measles		1		9	12	2	3	6		33
Influenza		72			1	3				76
Measles		1	1	453	341	48	34	20	22	920
Meningitis, meningococcus						1		2		3
Mumps		47		198	155	19	185	37	10	651
Poliomyelitis					2	3	1	1	3	10
Scarlet fever	1	3	4	42	71	3	8	8	10	150
Tuberculosis (all forms)		11	3	74	32	20	4	6	56	206
Typhoid and paratyphoid fever				2			1		1	4
Undulant fever				3	2			2	1	8
Venereal diseases:										
Gonorrhea	1	19	13	105	98	22	14	35	81	388
Syphilis		10	3	62	64	10	5	7	26	187
Other forms				1					4	5
Whooping cough				70	29	22	13	65	36	235

CUBA

Habana—Communicable diseases—4 weeks ended November 29, 1947.—During the 4 weeks ended November 29, 1947, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	12		Scarlet fever	2	
Malaria	3		Tuberculosis	8	5
Measles	1		Typhoid fever	13	2

Provinces—Notifiable diseases—4 weeks ended November 29, 1947.—During the 4 weeks ended November 29, 1947, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana[1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	10	19	9	16	1	10	65
Chickenpox		19					19
Diphtheria	3	17	1		1	3	25
Hookworm disease		17					17
Leprosy		2	1	1	3	4	11
Malaria	4	8	2	121	5	10	150
Measles		1		9	6		16
Poliomyelitis						1	1
Scarlet fever		2				1	3
Tuberculosis	21	12	13	33	14	42	135
Typhoid fever	12	24	4	7	5	31	83
Whooping cough		35		30			65
Yaws						1	1

[1] Includes the city of Habana.

FINLAND

Notifiable diseases—October 1947.—During the month of October 1947, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	7	Paratyphoid fever	282
Diphtheria	569	Poliomyelitis	40
Dysentery	16	Scarlet fever	221
Gonorrhea	1,426	Syphilis	368
Malaria	2	Typhoid fever	62

GREAT BRITAIN

Poliomyelitis.—For the period May 25 to December 20, 1947, 8,305 cases of poliomyelitis and 642 cases of polioencephalitis have been reported in Great Britain. The following table shows the numbers of cases reported by weeks since the week ended November 15, 1947:

Week ended—	Poliomyelitis	Polioencephalitis	Week ended—	Poliomyelitis	Polioencephalitis
Nov. 15	186	15	Dec. 6	70	6
Nov. 22	142	3	Dec. 13	77	7
Nov. 29	103	3	Dec. 20	55	5

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

Cholera

Syria.—On January 2, 1948, 1 case of cholera (delayed report) was reported in Damascus area Muhasazet, Syria, making a total of 42 cases and 13 deaths reported up to January 4, 1948.

Plague

Peru.—For the month of November 1947, 9 cases of plague with 6 deaths were reported in Peru by Departments as follows: Ancash Department, 1 case; Lima Department, 7 cases, 6 deaths; Piura Department, 1 case.

Smallpox

Angola.—For the month of October 1947, 50 cases of smallpox with 1 death were reported in Angola.

China—Shanghai.—For the week ended December 20, 1947, 40 cases of smallpox were reported in Shanghai, China.

Libya—Tripolitania.—For the week ended December 20, 1947, 38 cases of smallpox with 11 deaths were reported in Tripolitania, Libya.

×

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948

For sale by the Superintendent of Documents, United States Government Printing Office Washington 25, D. C.

Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 JANUARY 30, 1948 NUMBER 5

IN THIS ISSUE

Rat Flea Control With 5 and 10 Percent DDT Dusts

Preparation of Chlorine-Demand Free Water

Incidence of Communicable Diseases in the U. S.

Brucellosis in Federalsburg, Md.

U.S. PUBLIC HEALTH SERVICE

1798

CONTENTS

Page

A comparison of the effectiveness of 5 and 10 percent DDT-dusts for the control of rat fleas. H. Page Nicholson and Thomas B. Gaines 129

Notes on the preparation of chlorine-demand-free water. Stephen Megregian 137

Incidence of communicable diseases in the United States, November 30–December 27, 1947 141

Report of Brucellosis outbreak at Federalsburg, Maryland. James H. Steele and J. W. Hastings, Sr 144

Deaths during week ended January 3, 1947 145

INCIDENCE OF DISEASE

United States:

- Reports from States for week ended January 10, 1948, and comparison with former years 146
- Weekly reports from cities:
  - City reports for week ended January 3, 1948 150
  - Rates, by geographic divisions, for a group of selected cities 152
- Territories and possessions:
  - Hawaii Territory—Plague (rodent) 153
  - Panama Canal Zone—Notifiable diseases—November 1947 153

Foreign reports:

- Canada—Provinces—Communicable diseases—Week ended December 20, 1947 154
- Japan—Notifiable diseases—4 weeks ended November 29, 1947, and accumulated totals for the year to date 154
- New Zealand—Notifiable diseases—4 weeks ended November 29, 1947 155
- Norway—Notifiable diseases—September 1947 155
- Switzerland—Notifiable diseases—July–September 1947 155
- World distribution of cholera, plague, smallpox, typhus fever, and yellow fever—
  - Cholera 156
  - Plague 157
  - Smallpox 158
  - Typhus fever 159
  - Yellow fever 160

Public Health Reports

Vol. 63 • JANUARY 30, 1948 • *No. 5*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

A COMPARISON OF THE EFFECTIVENESS OF 5 AND 10 PERCENT DDT DUSTS FOR THE CONTROL OF RAT FLEAS[1]

By H. PAGE NICHOLSON, *Senior Assistant Scientist* and THOMAS B. GAINES, *Biologist, United States Public Health Service*[2]

Following the work of Davis (*1*) in which the effectiveness of DDT dust in controlling rat fleas was demonstrated, field tests were undertaken at Savannah to determine the formulations and methods of application most suitable for typhus control operations. Results of this work during 1945 indicated that dust containing 10 percent technical grade DDT and 90 percent pyrophyllite was satisfactory for general dusting work. During 1945 and 1946, the 10 percent DDT formulation was used in the large scale typhus control programs carried on jointly by State and local health departments and the United States Public Health Service with indications of excellent results. The possibility of using dusts containing a reduced amount of DDT for practical control operations has not been previously investigated.

PROCEDURES

During the latter part of July 1946, field studies were initiated at Columbia, S. C., to determine the value of dust containing 5 percent DDT for the control of rat fleas and to compare the results with those obtained in 1945 in Savannah where 10 percent dust was used. Seventeen rat infested business establishments of the same general type as those used in the Savannah investigation were treated. These establishments included 6 grocery stores, 6 cafes, a food warehouse, a wholesale vegetable produce store, a feed store, a drug store, and a paint store. In addition, 21 similar premises, located in the same general area as those treated, were used as checks. These included 7 grocery stores, 6 cafes, 2 laundries, a confectionary, a stable, a fruit stand, a variety store, a drug store, and an ice cream parlor. All establishments, both treated and check, were located in the vicinity of the main business district and comprised an area having a radius of 1½ miles.

---

[1] From the Communicable Disease Center, Technical Development Division, Savannah, Ga.

[2] The writers express their appreciation to Dr. S. W. Simmons, Chief of the Technical Development Division for making these investigations possible and for invaluable suggestions during the studies. They also thank Dr. C. A. Henderson, Director of the Savannah-Chatham County Health Department, Savannah, Ga., Dr. O. C. Caughman, Director of the City Health Department, Columbia, S. C., and their staffs for aid and cooperation in the work.

For evaluating the effectiveness of the 5-percent mixture, live rats were trapped prior to treatment, 6 to 8 days following treatment and thereafter at approximate intervals of 6 weeks. Sampling was discontinued at the end of about 3 months because of the drastic reduction in the normal rat flea population due to the approach of winter. Maximum duration of effective control was not determined for this reason.

Ectoparasites were collected from the rats by a combination of combing and beating. This method has been described in detail in a previous paper by Ludwig and Nicholson (*2*).

A total of five species of fleas was taken throughout the course of the study. *Xenopsylla cheopis* (Roth.), the oriental rat flea, was by far the most abundant of these species. Other species collected were: *Nosopsyllus fasciatus* (Bosc.), *Leptopsylla segnis* (Schönherr), *Echidnophaga gallinacea* (Westwood), and *Ctenocephalides felis* (Bouché).

A number of other species of ectoparasites also were present. These included the mites, *Liponyssus bacoti* (Hirst), *Laelaps nuttalli* (Hirst), *Echinolaelaps echidninus* (Berlese), *Atricholaelaps glasgowi* (Ewing), and three unidentified species of the genera *Atricholaelaps*, *Cosmolaelaps*, and *Uropoda*. Only one species of louse, *Polyplax spinulosa* (Berm.), was taken.

No claim is made for controlling rat mites or lice with 5 percent DDT dust. Although there were indications of some initial control of these ectoparasites, extreme variations in the number of mites and lice present on the rats examined make it inadvisable to draw any conclusions from the data available.

The 5 percent DDT dust was applied in the same manner as the 10 percent DDT dust. Stress was placed upon dusting rat burrow systems and enclosed harborage areas, with which rat nests are usually associated. For this purpose the Cyanogas Foot Pump [3], fitted with a 5-pound capacity dust chamber, was used (fig. 1). This piece of dusting equipment proved excellent for dispersing dust throughout the entire burrow system or enclosed harborage area.

As a secondary means of treatment, 5 percent DDT dust was applied in generous patches on active rat runs and into and around rat holes. Two types of shaker cans were used for this purpose—one a rectangular can of about 5-pound capacity and the other, a 1-pound capacity cylindrical can mounted on a 3-foot handle (fig. 2). The latter shaker was well adapted for use in dusting runways not accessible

---

[3] The Cyanogas Foot Pump is a product of the American Cyanamid & Chemical Corp., New York, N. Y,

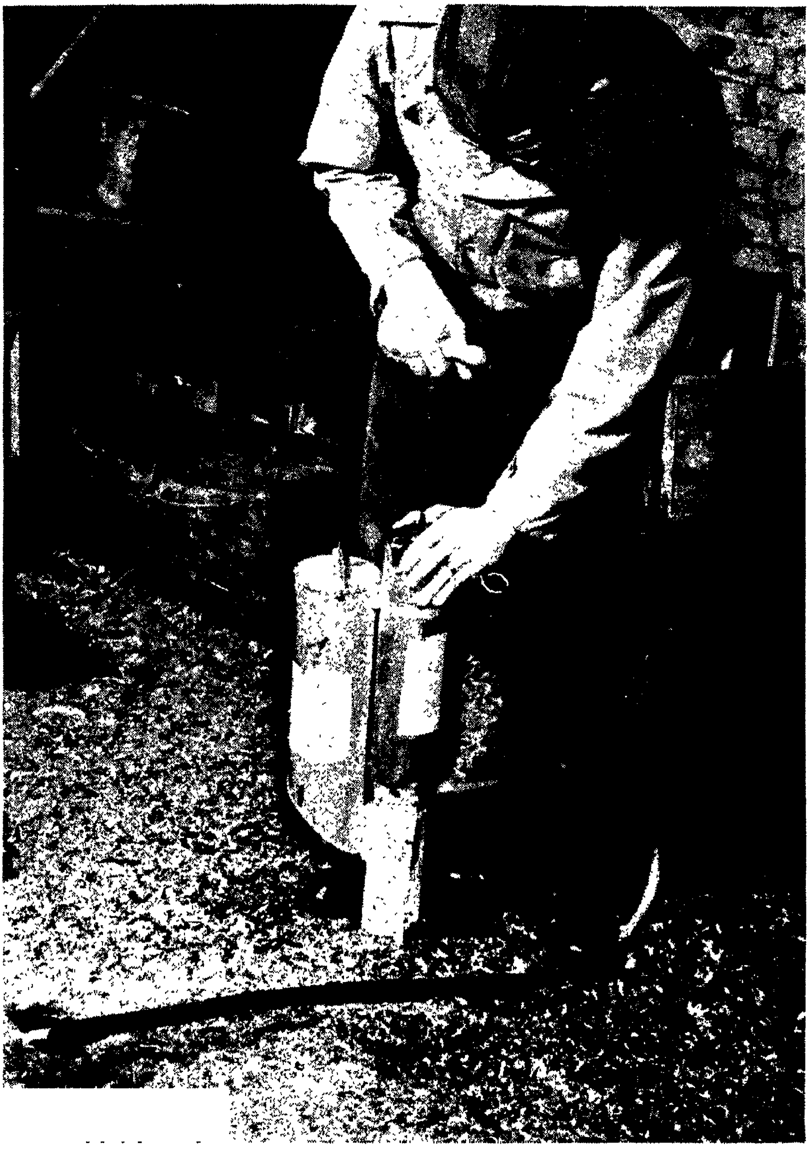


FIGURE 1.—Cyanogas gun in use (taken from Ludwig and Nicholson (2)).

to the large can and in treating such places as overhead runways. These dusters have been described in detail by Ludwig and Nicholson (*2*).

The amount of dust used per premise varied with the size of the establishment and the degree of rat infestation. In the series of tests with 10 percent DDT, the first three premises received an unnecessarily large amount of dust, but thereafter the amount applied per premise was comparable between the 5 percent and 10 percent formulations. Exclusive of these first three establishments, an average of 6 pounds of dust was applied per premise in both 5 and 10 percent studies. The range of these applications varied from 1¾ to 14½ pounds.

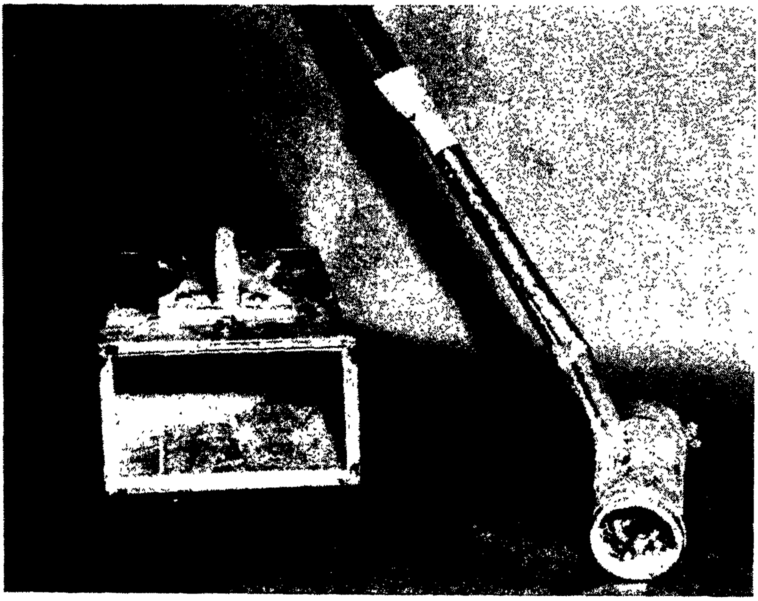


FIGURE 2.—Rectangular and cylindrical dust cans (taken from Ludwig and Nicholson (2)).

RESULTS

A comparison of the results obtained with these two formulations is based primarily on the control achieved against *Xenopsylla cheopis* (Roth.), the oriental rat flea, because it was by far the predominant species of flea present. Other species of fleas formed a comparatively minor part of the total flea populations.

The normal population of *X. cheopis* in the check establishments during both the 5 percent and 10 percent DDT investigations are shown graphically in figure 3 and are compared with the populations in the treated establishments. Each point on the curves is an index, or arithmetic mean, of the *X. cheopis* population from the particular group of establishments concerned.

Because trapping was necessary over a period of several nights during each sampling period in order to obtain adequate live samples of rats, the positions of the points on the horizontal axis, or days-after-treatment scale, represent average trapping dates.

Check establishments for the 10 percent DDT studies were chosen so as to be representative of the city as a whole. In all, 46 business establishments of the same general type as those treated were used as checks. From them a total of 384 rats was taken, the catch ranging from 31 to 70 for each trapping period. A total of 206 rats was taken from 11 treated establishments, the catch varying from 48 to 59 per trapping period. With the exception of 6 *Rattus rattus*, all of the rats trapped in the 10 percent DDT field studies were the brown rat, *Rattus norvegicus.*

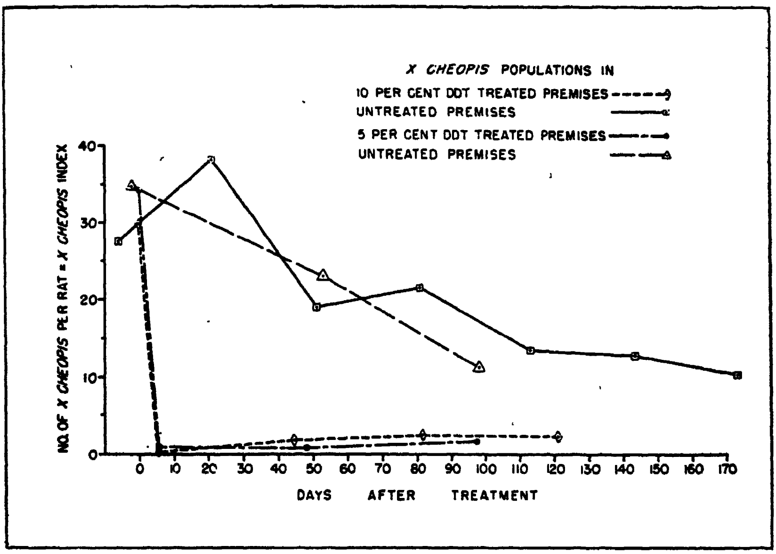


FIGURE 3.—Comparison of 5 and 10 percent DDT dusts applied for control of the oriental rat flea, *Xenopsylla cheopis* (Roth.).

In the 5-percent studies the population of *X. cheopis* in the check establishments was determined from 172 rats. The catch per trapping period ranged from 42 to 77 rats. A total of 218 rats was taken from the 17 treated premises, with catches ranging from 52 to 110 per trapping period. All rats caught were of one species, *Rattus norvegicus.*

It should be noted (fig. 3 and table 1) that the rat flea populations were almost completely eliminated within approximately 1 week after application of both the 5 percent and the 10 percent dusts. These outstanding reductions occurred consistently in the individual treated establishments as shown in table 2. At the end of a period of roughly 3 months, in the case of both 5 percent and 10 percent DDT, recovery had not occurred to a significant degree.

TABLE 1.—*Comparative data from DDT-treated establishments and check establishments*

DDT-TREATED ESTABLISHMENTS

5 percent DDT				10 percent DDT			
Days after treatment	Number of rats	*X. cheopis* index	Total fleas index	Days after treatment	Number of rats	*X. cheopis* index	Total fleas index
6	[1] 52	0.7	0.9	6	59	0.2	0.3
48	110	0.9	1.6	44	50	1.7	1.7
97	56	1.6	1.8	81	49	2.6	2.7
				121	48	2.3	2.6
CHECK ESTABLISHMENTS							
−2 (pretreatment)	77	34.7	38.3	−6 (pretreatment)	70	27.5	38.9
53	[2] 53	23.3	26.6	21	31	38.1	38.7
98	42	11.6	17.7	51	42	19.2	19.4
				81	86	21.5	21.6
				112	72	13.5	14.1
				143	35	12.9	14.4
				173	48	10.6	11.4

[1] One aberrant rat with 71 *X. cheopis* and 2 *E. gallinacea* is not included in the indices. Out of 12 other rats caught from the same establishment and at the same time, 10 had no fleas, 1 had 2, and a third had 4. The aberrant rat may have been an invader which had not yet contacted the DDT dust. If counted, the indices would be 2.0 and 2.2.

[2] One aberrant rat with 354 *X. cheopis* not included in the indices above. Indices, if included, are 29.4 and 32.7.

Comparative population recovery and control of *X. cheopis* in treated premises, expressed as percent of the normal population, are indicated in table 3. These percentages were determined for the first posttreatment period (6 days after treatment) by directly comparing pre- and posttreatment flea indices. Thereafter they were obtained by a comparison of the indices in treated and check establishments. It will be noted that the difference in the initial control achieved in the 5-percent series (98.0 percent) and in the 10 percent series (99.3 percent) was insignificant and that, even after a period of 3 months, there apparently still were no significant differences in the degree of recovery by *X. cheopis* following application of either concentration of DDT dust (fig. 3 and 4, and table 3).

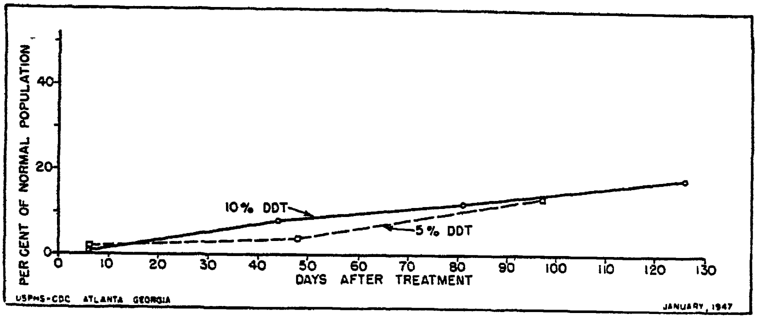


FIGURE 4.—Comparative recovery by the oriental rat flea, *Xenopsylla cheopis* (Roth.), following treatment with 5 and 10 percent DDT dusts.

The duration of control resulting against species of fleas other than *X. cheopis* could not be determined beyond the first posttreatment period in either the 5 or 10 percent DDT studies because these species were taken only in small numbers from check establishments during the later sampling periods. As indicated in table 2, however, they appear to be as readily controlled as *X. Cheopis* at the sampling period 1 week following each type of treatment.

In the 5 percent DDT studies *Echidnophaga gallinacea*, the sticktight flea, was the only flea species other than *X. cheopis* present in numbers large enough to consider. While 152 specimens were collected from 13 rats taken in 5 establishments before treatment, only 7 *E. gallinacea* were taken from a total of 3 rats caught in 3 establishments during the first posttreatment trapping period.

TABLE 2.—*Initial results of DDT dusting for rat flea control*[1]

5 percent DDT				10 percent DDT			
Type establishment	Rats trapped	Flea indices		Type establishment	Rats trapped	Flea indices	
		X. cheopis	Other species			*X. cheopis*	Other species
Wholesale grocery	3 5	39.0 1.6	0.7 .0	Wholesale grocery	8 4	10.0 .0	18.4 .0
Grocery warehouse	8 3	82.3 .7	11.3 .0	Poultry hatchery	2 3	30.0 .0	.5 .0
Pharmacy	3 2	23.0 .5	.3 .0	Wholesale grocery	10 8	42.6 1.0	37.3 .1
Paint store	3 3	21.7 .0	.0 .0	Wholesale grocery	5 2	5.8 .5	9.8 .5
Cafe	2 2	54.0 .0	.0 .0	Produce & Poultry Co.	7 6	5.1 .0	1.3 .0
Retail grocery	1 2	19.0 .0	109.0 .5	Feed and pet store	5 1	28.6 1.0	2.0 .0
Cafe	6 2	95.8 .0	3.2 .0	Poultry company (abattoir).	7 6	40.0 .0	28.9 .0
Wholesale produce	4 0	14.0 --------	3.5 --------	Retail grocery	8 10	57.5 .1	.0 .0
Retail grocery	5 0	36.2 --------	.0 --------	Retail grocery	6 6	22.7 .2	.1 .0
Cafe	7 5	14.4 3.2	.0 .0	Cafe	8 7	20.5 .0	.3 .0
Retail grocery	6 4	36.0 .0	5.3 1.0	Retail grocery	4 6	10.2 .0	.0 .0
Cafe	1 1	14.0 1.0	.0 .0				
Cafe	7 4	10.6 .0	.0 .0				
Feed store	9 [2] 12	18.8 .5	.0 .0				
Retail grocery	4 1	15.5 .0	3.0 1.0				
Retail grocery	3 1	27.3 .0	.0 .0				
Cafe	5 5	17.8 .8	.0 .0				
Totals	77 52	34.7 .7	3.6 .2	Totals	70 59	27.5 .2	11.4 .1

---

[1] For each establishment, the first figures represent pretreatment and the second, the first posttreatment evaluation period. In the 5 percent DDT studies, the mean pretreatment trapping date was 2 days prior to treatment, while in the 10 percent DDT studies it was 6 days prior to treatment. The mean trapping date for the first posttreatment evaluation period was 6 days following treatment in both the 5 and 10 percent DDT tests.

[2] One aberrant rat with 71 *X. cheopis* and 2 *E. gallinacea* is not included. If counted, indices would be 5.9 and 0.2 respectively. See footnote 1 on table 1.

TABLE 3.—*Comparative control and recovery following DDT dusting, of X. cheopis expressed as percent of the normal population*

5 percent DDT			10 percent DDT		
Days after treatment	Percent recovery and survival	Percent control	Days after treatment	Percent recovery and survival	Percent control
6	2.0	98.0	6	0.7	99.3
48	3.9	96.1	44	8.8	91.2
97	13.5	86.5	81	12.1	87.9
			121	17.4	82.6

In the 10 percent DDT studies approximately the same results were obtained, but a more varied population of fleas other than *X. cheopis* was present prior to treatment. At the pretreatment trapping period, 39 out of a total of 77 rats bore 31 *Nosopsyllus fasciatus*, 462 *Leptosylla segnis*, 238 *Echidnophaga gallinacea*, and 72 *Ctenocephalides felis*. Roughly a week following treatment with 10 percent DDT dust these same establishments yielded 59 rats, 3 of which bore a total of 3 fleas other than *X. cheopis*—2 *N. fasciatus* and 1 *L. segnis*. These three rats were caught from three separate establishments.

SUMMARY

Comparative data are presented concerning the effectiveness of single applications of 5 and 10 percent DDT dust applied under field conditions to control rat fleas in business establishments. No significant differences could be detected over a period of 3 months. *Xenopsylla cheopis* (Roth.), the oriental rat flea, was the predominant species present. Other species of rat fleas were scarce both in treated and check establishments, especially during the later phases of the investigations. For this reason comparisons are based primarily upon the oriental rat flea.

REFERENCES

(*1*) Davis, David E. The control of rat fleas (*Xenopsylla cheopis*) by DDT. Pub. Health Rep. **60:** 485–489 (1945).

(*2*) Ludwig, R. G. and Nicholson, H. P.: The control of rat ectoparasites with DDT. Pub. Health Rep. **62:** 77–84 (1947).

NOTES ON THE PREPARATION OF CHLORINE-DEMAND-FREE WATER [1]

By STEPHEN MEGREGIAN, *P. A. Sanitarian, United States Public Health Service*

In the studies on the chemical and bactericidal properties of "free" chlorine and chloramine in water, large quantities of chlorine-demand-free water were required at this laboratory. Several methods of preparation were attempted, including the method outlined in Standard Methods (*1*), but only one was found to be satisfactory for these studies.[2]

Water prepared by the procedure described in Standard Methods was found unsatisfactory because of two factors. First, the chlorine demand of the distilled water sometimes could not be satisfied by a 0.5 p. p. m. chlorine dose. Secondly, it was difficult to remove the residual chlorine by boiling in a water buffered at about pH 6.0. In another method, distilled water was dosed with 2.0 to 5.0 p. p. m. of chlorine, allowed to stand 24 hours, then partially dechlorinated with sulfite to a residual of about 0.1 p. p. m. chlorine, and boiled. After boiling, the water was cooled and any remaining residual was removed by further addition of sulfite and vigorous shaking to oxidize any excess of sulfite. This method proved quite satisfactory for the studies on the chemical properties of chloramines, but did not stand up well in the low residuals (0.02 to 0.05 p. p. m.) required for the studies of bactericidal properties of "free" chlorine. The possibility of dechlorination by exposure to sunlight was also investigated, but the time required to dechlorinate 0.6 p. p. m. of free chlorine proved impractical (from 6 to 24 hours of sunlight), depending on the type of glass in which the water was stored, and also on the presence and quality of sunlight.

The method found most satisfactory and which is recommended is as follows: A carboy of distilled water was dosed with 2.0 to 5.0 p. p. m. of available chlorine with a standard chlorine or hypochlorite solution and allowed to stand at least 24 hours. Just before the water was to be used, it was boiled, cooled by storing in a 20° C. room for 24 hours, and then carefully dechlorinated in gradual steps, using a freshly prepared 0.2 percent solution of sodium sulfite. The dechlorination was carried out so that the last trace of chlorine was removed with only a slight excess of sulfite and any excess sulfite was destroyed by stoppering the bottle and vigorously shaking the contents in order to facilitate the oxidation of sulfite with dissolved oxygen. After dechlorination, the water was tested for chlorine demand by adding a calculated amount of chlorine (0.05 to 0.10 p. p. m.) to a portion of the prepared water, allowing it to stand at least 5 minutes, and determining the residual with ortho-tolidine. With free chlorine the total color is developed within 1 minute. The drop in chlorine residual after the 5 minutes of contact was not greater than 0.01 p. p. m. In fact, no drop in residual chlorine occurred if the dechlorination and aeration were carried out carefully. Water thus prepared gave the Laux (*2*) and the Moore (*3*) qualitative "flash" test for "free" chlorine after the 5 minutes of contact.

---

[1] From the Sanitary Engineering Division.

[2] The procedures reported herein were developed prior to 1943. Reference to their use is made in Public Health Reports 58, No. 51, p. 3 (Dec. 17, 1943). Formal publication of these notes has been delayed due to the transfer of the personnel familiar with the work to other duties during the war years.

If the prepared water is to be used in bacteriological experiments, it should not be sterilized in an autoclave as the steam in the autoclave usually contains ammonia and other volatile materials which will impart a chlorine demand to the prepared water. Also, if the water is left unstoppered for a sufficient period in the laboratory atmosphere, ammonia will gradually dissolve in the prepared water and produce a chlorine demand. The water for the bacteriological experiments was boiled in a cotton plugged flask for 20 minutes in order to kill vegetative organisms. All glassware in contact with the prepared water should be chemically clean. In this laboratory, the glassware was cleaned with chromic acid followed by at least 10 rinses with tap water and 2 rinses with chlorine-demand-free water before sterilization in the hot-air oven. As a rule, chlorine-demand-free water should be prepared fresh for immediate use as it does not keep well over 48 hours.

Water prepared by the above method has been used in experiments on the bactericidal properties of free chlorine. Tables 1–4 illustrate the performance of this prepared water with regard to the maintenance of "free" chlorine residuals. The data in these tables were obtained in a series of experiments on the bactericidal properties of free chlorine.

DISCUSSION

The results presented in tables 1, 2, 3, and 4 show an average chlorine loss of 0.000 to 0.004 p. p. m. after 5 minutes of contact with the prepared water. Most of the experiments at pH values above 8.5 show no loss at all even in the lowest concentration of free chlorine dosed. The column showing maximum loss of chlorine after 5 minutes contact serves to point out that extraneous chlorine demand can easily be introduced even under the most carefully controlled experimental conditions. These losses are more significant in the extremely low concentrations of free chlorine in that a trace of chlorine demand may react with all the applied chlorine whereas in the higher concentrations, any slight chlorine loss cannot be readily measured by the present methods for determining residual chlorine. Therefore, when working with extremely low concentrations of chlorine in chlorine-demand-free water, every precaution should be taken not to introduce organic matter into the reaction mixture. Losses in chlorine residual which are noted in the columns marked footnote 1 may be attributed to the introduction of the bacterial suspension and the absorption of chlorine by these organisms. These bacterial suspensions also contain soluble nutrient materials leached out of the agar slants on which the bacteria are cultured. However, these data indicate that the chlorine demand of such cultures for 1 hour contact is relatively small in a chlorine-demand-free water.

TABLE 1.—*Stability of Chlorine Residuals in Chlorine-Demand-Free-Water at* pH *7.0*

Number of experiments included in averages	Chlorine dosage p. p. m.	Average free chlorine residual, p. p. m., after—			Maximum chlorine lost p. p. m., after—			Temp. ° C.
		5 minutes	60 minutes[1]	120 minutes[1]	5 minutes	60 minutes[1]	120 minutes[1]	
20	0.02	0.016	----------	0.010	0.015^{2}	----------	0.02^{3}	20-25
16	.03	.026	----------	.019	$.01^{6}$	----------	$.02^{4}$	20-25
14	.04	.037	----------	.031	$.02^{1}$	----------	$.03^{1}$	20-25
13	.05	.046	----------	.040	$.02^{1}$	----------	$.03^{1}$	20-25
9	.06	.060	----------	.051	$.01^{1}$	----------	$.02^{2}$	20-25
9	.08	.079	0.072	----------	$.01^{2}$	----------	----------	20-25
4	.02	.020	----------	.020	$.00^{4}$	----------	$.00^{4}$	2-5
4	.03	.030	----------	.023	$.00^{4}$	----------	$.01^{3}$	2-5
4	.04	.040	----------	.038	$.00^{4}$	----------	$.01^{1}$	2-5
4	.05	.050	----------	.040	$.00^{4}$	----------	$.01^{1}$	2-5
2	.06	.060	----------	.060	$.00^{2}$	----------	$.00^{2}$	2-5
2	.07	.070	----------	.065	$.00^{2}$	----------	$.01^{1}$	2-5
2	.08	.080	.080	----------	$.00^{2}$	0.00^{2}	----------	2-5
2	.10	.100	.090	----------	$.00^{2}$	$.02^{1}$	----------	2-5

[1] After inoculation with the test organisms (about 2,000 organisms per cc of test water).

NOTE.—Superscripts signify the number of experiments in which the maximum chlorine loss occurred.

TABLE 2.—*Stability of Chlorine Residuals in Chlorine-Demand-Free Water at* pH *8.5*

Number of experiments included in averages	Chlorine dosage p. p. m.	Average free chlorine residual, p. p. m. after—		Maximum chlorine lost, p. p. m. after—		Temperature °C.
		5 minutes	60 minutes[1]	5 minutes	60 minutes[1]	
2	0.03	0.030	0.025	0.00^{2}	0.01^{1}	20-25
6	.05	.050	.042	$.01^{1}$	$.02^{2}$	20-25
6	.07	.070	.062	$.01^{1}$	$.04^{1}$	20-25
4	.10	.100	.085	$.02^{1}$	$.05^{1}$	20-25
6	.15	.150	.143	$.01^{1}$	$.03^{1}$	20-25
6	.20	.200	.187	$.00^{6}$	$.03^{2}$	20-25
2	.05	.050	.045	$.00^{2}$	$.01^{1}$	2-5
2	.07	.070	.055	$.00^{2}$	$.02^{1}$	2-5
2	.10	.100	.085	$.00^{2}$	$.03^{1}$	2-5
2	.12	.120	.115	$.00^{2}$	$.01^{1}$	2-5
2	.15	.150	.150	$.00^{2}$	$.00^{2}$	2-5
1	.20	.20	.17	$.00^{1}$	$.03^{1}$	2-5

[1] After inoculation with the test organisms (about 2,000 organisms per cc. of test water).

NOTE.—Superscripts signify the number of experiments in which the maximum chlorine loss occurred.

TABLE 3.—*Stability of Chlorine Residuals in Chlorine-Demand-Free Water at* pH *9.8*

Number of experiments included in averages	Chlorine dosage p. p. m.	Average free chlorine residual, p. p. m. after—		Maximum chlorine lost, p. p. m. after—		Temperature °C.
		5 minutes	60 minutes[1]	5 minutes	60 min. utes[1]	
2	0.03	0.030	0.030	0.00^{2}	0.00^{2}	20–25
5	.05	.050	.046	$.01^{1}$	$.01^{2}$	20–25
8	.10	.100	.096	$.00^{8}$	$.02^{1}$	20–25
2	.15	.150	.140	$.00^{2}$	$.02^{1}$	20–25
3	.20	.200	.187	$.00^{3}$	$.02^{2}$	20–25
3	.25	.250	.240	$.00^{3}$	$.03^{1}$	20–25
5	.30	.296	.268	$.02^{1}$	$.05^{2}$	20–25
5	.40	.400	.364	$.00^{5}$	$.05^{2}$	20–25
2	.50	.500	.460	$.00^{2}$	$.04^{2}$	20–25
2	.70	.700	.675	$.00^{2}$	$.05^{1}$	20–25
2	1.00	1.000	.950	$.00^{2}$	$.10^{1}$	20–25
4	.05	.050	.045	$.00^{4}$	$.01^{2}$	2–5
4	.10	.100	.100	$.00^{4}$	$.00^{4}$	2–5
4	.20	.200	.200	$.00^{4}$	$.00^{4}$	2–5
4	.40	.400	.380	$.00^{4}$	$.04^{2}$	2–5
4	.70	.700	.700	$.00^{4}$	$.00^{4}$	2–5
4	1.00	1.000	1.000	$.00^{4}$	$.00^{4}$	2–5

[1] After inoculation with the test organisms (about 2,000 organisms per cc. of test water).

NOTE.—Superscripts signify the number of experiments in which the maximum chlorine loss occurred.

TABLE 4.—*Stability of Chlorine Residuals in Chlorine-Demand-Free Water at* pH *10.7*

Number of experiments included in averages	Chlorine dosage p. p. m.	Average free chlorine residual, p. p. m. after—		Maximum chlorine lost, p. p. m. after—		Temperature °C.
		5 minutes	60 minutes[1]	5 minutes	60 min. utes[1]	
2	0.02	0.020	0.020	0.00^{2}	0.00^{2}	20–25
2	.03	.030	.025	$.00^{2}$	$.01^{1}$	20–25
2	.04	.040	.035	$.00^{2}$	$.01^{1}$	20–25
5	.05	.050	.046	$.00^{5}$	$.01^{2}$	20–25
2	.07	.070	.060	$.00^{2}$	$.01^{2}$	20–25
7	.10	.100	.099	$.00^{7}$	$.01^{1}$	20–25
4	.20	.200	.195	$.00^{4}$	$.02^{1}$	20–25
3	.25	.250	.233	$.00^{3}$	$.03^{1}$	20–25
7	.30	.300	.281	$.00^{7}$	$.05^{1}$	20–25
7	.40	.400	.386	$.00^{7}$	$.05^{2}$	20–25
4	.50	.500	.490	$.00^{4}$	$.04^{1}$	20–25
3	.70	.700	.700	$.00^{3}$	$.00^{3}$	20–25
3	1.00	1.000	1.00	$.00^{3}$	$.00^{3}$	20–25
2	.10	.100	.100	$.00^{2}$	$.00^{2}$	2–5
2	.30	.300	.300	$.00^{2}$	$.00^{2}$	2–5
2	.40	.400	.400	$.00^{2}$	$.00^{2}$	2–5
2	.50	.500	.500	$.00^{2}$	$.00^{2}$	2–5
2	.70	.700	.700	$.00^{2}$	$.00^{2}$	2–5
2	1.00	1.000	1.000	$.00^{2}$	$.00^{2}$	2–5

[1] After inoculation with the test organisms (about 2,000 organisms per cc of test water).

NOTE.—Superscripts signify the number of experiments in which maximum chlorine loss occurred.

REFERENCES

(1) Standard Methods for the Examination of Water and Sewage, Am. Pub. Health Assoc., Ed. 8. Lancaster, Pa., Lancaster Press, Inc. (1936), p. 22.
(2) C. P. Laux: Breakpoint Chlorination at Anderson, Indiana, J. Am. Water Works Assoc. 32: 1027 (1940).
(3) W. A. Moore: Use of p-Aminodimethylaniline as an Indicator for Free Chlorine, J. Am. Water Works Assoc. 35: 427 (1943).

INCIDENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

November 30–December 27, 1947

The accompanying table summarizes the incidence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in PUBLIC HEALTH REPORTS under the section "Incidence of Disease." The table gives the number of cases of these diseases for the 4 weeks ended December 27, 1947, the number reported for the corresponding period in 1946, and the meidan number for the years 1942–46.

DISEASES ABOVE MEDIAN INCIDENCE

Influenza.—For the 4 weeks ended December 27 there were 14,500 cases of influenza reported. The median incidence for the preceding 5 years (1942–46) was 11,686 cases. The current high incidence of this disease is still confined largely to 3 States: Texas (6,664 cases), South Carolina (2,013), and Virginia (1,992). Only 3 other States have reported more than 100 cases weekly—Alabama, Arizona, and California. Few cases are being reported from the North Atlantic and North Central sections.

According to reports received from State health officers there was no indication of a widespread influenza epidemic. There have been press reports of outbreaks of "colds" in some localities and an outbreak of undetermined respiratory infection, later identified as type A influenza virus, was reported in Los Angeles with 200,000 persons attacked. Later press reports say that the schools in certain sections of Texas have been closed on account of an undetermined respiratory disease, which may account somewhat for the increase in the number of cases of influenza in that State from 1,498 during the preceding week to 2,015 for the week ended December 27.

The number of cases of influenza for the year 1947 was higher than in 1946 but it was lower than in any of the 3 preceding years. The minor epidemic of 1947 did not start until March and it was midsummer before the number of cases had dropped to a normal level.

Measles.—The number of cases (15,344) of measles reported for the current 4-week period represented a 48 percent increase over the median for the preceding 5 years. During the early part of 1947 the incidence of this disease was considerably below that of 1946, but during the last 3 four-week periods of 1947 the cases have exceeded those reported for the corresponding periods in 1946 and for the 4 weeks ended December 27 the number of cases was the highest since 1943 when approximately 30,000 cases were reported for the corresponding weeks. During most of the year, however, the incidence was below the normal seasonal level, and the number of cases reported for the year was less than 40 percent of the median for the years 1942–46.

Typhoid and paratyphoid fever.—During the 4 weeks ended December 27 there were 221 cases of these diseases as compared with 166 for the corresponding period in 1946 and a median of 217 cases for the preceding 5 years. The West

South Central section reported the largest excess of cases, due largely to the occurrence of 30 cases of paratyphoid fever in Oklahoma. Pennsylvania reported 26 of the 39 cases of typhoid fever occurring in the Middle Atlantic section. In other sections the number of cases either was not significantly higher than the 1942–46 median or fell below it. Although the number of cases during the last 4 months of 1947 exceeded those reported during the same months of 1946 the total number of cases reported for the year 1947 will probably be the lowest on record for these diseases.

Whooping cough.—This disease continued at a relatively high level, the 9,667 cases reported for the current 4-week period being 1.1 times the 1946 incidence and 1.3 times the median for the 5 preceding years (1942–46). Each section of the country except the Middle Atlantic reported an increase in cases over the normal seasonal expectancy. This disease has maintained a relatively high incidence throughout the entire year and the number of cases (153,505) was the highest since 1913 when approximately 176,000 were reported. The annual 5-year median expectancy was about 123,000 cases.

DISEASES BELOW MEDIAN INCIDENCE

Diphtheria.—The incidence of diphtheria dropped again to a relatively low level, the number of cases (1,291) reported for the 4 weeks ended December 27 being 91 percent of the median for the preceding 5 years. The median was represented by the 1946 incidence (1,416 cases). In the South Atlantic and Mountain sections the numbers of cases were larger than might be expected normally, but in other sections the incidence either closely approximated the median or fell below it. After a slight break in the downward trend of this disease in 1944 and 1945 the incidence has started down again and the total cases for the year 1947 will be the lowest ever reported.

Meningococcus meningitis.—The number of cases (224) of meningococcus meningitis was 90 percent of the 1946 incidence for the corresponding 4 weeks and 45 percent of the median for the preceding 5 years. The number of cases was relatively low in all sections of the country, and for the country as a whole the incidence was the lowest since 1941 when 143 cases were reported during the corresponding 4 weeks. States reporting the largest number of cases were California 19, Pennsylvania 18, Texas 15, New York and Oklahoma 14 each, Connecticut and Ohio 11 each, and North Carolina 10. No other State reported more than 7 cases.

Poliomyelitis.—For the 4 weeks ended December 27 there were 360 cases of poliomyelitis reported. There were 688 cases reported during the corresponding 4 weeks in 1946 and the median for the preceding 5 years was 932 cases. The incidence remained relatively high in a few States in the East North Central, South Atlantic, and Mountain sections, but in other sections the number of cases occurring was either about normal or was considerably below the normal seasonal expectancy. After 4 years of unusually high incidence this disease has returned to a more normal level and the number of cases reported for the year 1947 will no doubt be the lowest since 1942 when approximately 4,200 cases were reported.

Scarlet fever.—The incidence of this disease was the lowest on record for this period. The number of reported cases (7,167) was 87 percent of the number reported in 1946 and 65 percent of the 1942–46 median for the corresponding 4 weeks. The number of cases in each geographic section was considerably below the normal median expectancy. The year 1947 was the lowest year on record for this disease, with a total of about 83,000 cases as compared with a 5-year median of approximately 140,000 cases.

Smallpox.—For the 4 weeks ended December 27 there were 13 cases of smallpox reported as compared with 7 for the corresponding weeks in 1946 and a median of 28 cases for the preceding 5 years (1942–46). The cases were confined to 3 sections of the country, the East North Central (4 cases), West North Central (7 cases), and the South Atlantic (2 cases). For the first time since September 1946 the incidence for a current 4-week period was higher than during the same weeks in the preceding year. While the current incidence was slightly above the 1946 figure it was lower than in any preceding year for which data are available in this form. For the year 1947 a total of 170 cases of smallpox was reported as compared with a median of 386 cases for the preceding 5 years.

MORTALITY, ALL CAUSES

For the 4 weeks ended December 27 there were 38,570 deaths from all causes reported to the National Office of Vital Statistics by 93 large cities. The median number for the corresponding period in the years 1944–46 was 36,425 deaths. The number of deaths was higher than the median for the 3 preceding years in the first 3 weeks of the current period, but during the last week of the period the number of deaths was 11 percent below the 3-year median.

Number of reported cases of 9 communicable diseases in the United States during the 4-week period November 30–December 27, 1947, the number for the corresponding period in 1946, and the median number of cases reported for the corresponding period, 1942–46

Division	Current period	1946	5-year median	Current period	1946	5-year median	Current period	1946	5-year median
	Diphtheria			Influenza [1]			Measles		
United States	1,291	1,416	1,416	14,500	11,686	11,686	15,344	9,902	10,381
New England	40	104	50	14	30	102	359	2,816	2,081
Middle Atlantic	120	196	127	47	60	121	2,567	3,327	3,327
East North Central	143	197	197	112	167	341	5,668	965	1,655
West North Central	99	128	124	86	112	151	2,077	102	435
South Atlantic	328	257	248	4,517	3,734	3,755	1,325	1,343	563
East South Central	149	207	166	688	333	662	147	134	224
West South Central	218	153	272	7,911	6,100	7,444	1,169	213	316
Mountain	122	74	68	716	1,065	1,065	836	563	685
Pacific	66	100	116	409	85	237	1,196	439	1,164
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	224	248	498	360	688	932	7,167	8,257	10,982
New England	16	18	39	9	36	16	616	898	1,172
Middle Atlantic	40	47	115	49	81	52	1,435	1,797	2,122
East North Central	28	41	99	97	178	50	2,017	2,566	2,913
West North Central	18	16	34	16	128	41	745	644	1,190
South Atlantic	33	41	87	48	49	29	636	664	1,089
East South Central	21	24	54	15	32	11	381	333	481
West South Central	32	25	43	19	61	34	245	188	392
Mountain	8	9	25	55	19	19	394	407	640
Pacific	28	27	71	52	104	87	698	758	1,128
	Smallpox			Typhoid and paratyphoid fever			Whooping cough		
United States	13	7	28	221	166	217	9,667	8,709	7,297
New England	0	0	0	16	14	16	1,257	1,044	1,068
Middle Atlantic	0	0	0	39	21	29	1,794	2,289	2,094
East North Central	4	1	6	17	20	30	2,094	2,348	1,671
West North Central	7	4	9	10	7	7	664	267	306
South Atlantic	2	0	1	37	26	39	1,270	1,065	982
East South Central	0	0	3	13	22	22	421	346	346
West South Central	0	2	4	60	23	43	1,007	770	691
Mountain	0	0	2	11	21	14	586	243	251
Pacific	0	0	0	18	12	13	574	337	544

---

[1] New York, North Carolina, and Pennsylvania excluded; New York City and Philadelphia included.

REPORT OF BRUCELLOSIS OUTBREAK AT FEDERALSBURG, MARYLAND[1]

By JAMES H. STEELE, *Scientist (R), United States Public Health Service* and J. W. HASTINGS, SR., *Assistant Director, Maryland Live Stock Sanitary Service*

During January and February 1946, 28 cases of human brucellosis were reported in a small town in eastern Maryland. *Brucella abortus* was isolated by the Maryland State Health Laboratory from two human cases. The other human cases had positive blood agglutination and clinical symptoms of the disease. Epidemiological investigations by the local health department attributed the epidemic to infected milk that was distributed during the Christmas holidays by a local raw-milk dealer.

During the Christmas season there was a shortage of milk in the community and the local milk dealer purchased additional milk from an uninspected source (Herd 3). This uninspected milk was only used if the normal supply was not sufficient. In this way there was no factor of dilution which would have prevented the ingestion of a large number of organisms by the individuals who used this infected milk.

The Maryland Live Stock Sanitary Service investigated the raw-milk source and found that Herd No. 1 was accredited as being free of brucellosis as of November 15, 1946. There were 40 animals in the herd and no adulthood vaccination was practiced. Sixteen of the adult animals had been vaccinated as calves. This farm is owned by the raw-milk distributor. Since January 1946 all milk has been pasteurized.

Herd No. 2 had considerable evidence of infection. There were twelve adult cattle in the herd of which four were reactors. Three of these reactors being plus 4 and one a plus 3. This herd was tested March 4, 1946.

Herd No. 3 had fourteen adults of which seven were reactors. All reactors had high titers except one. It was reported that there had been many abortions in this herd. Three of these reactors have been sold. The remainder are being held under quarantine and the milk from these infected animals is being sold to a pasteurization plant outside the community. This supply was the uninspected milk used during the Christmas season by the local raw-milk distributor. None of the animals in this herd have been vaccinated.

This is the first large brucellosis (undulant fever) epidemic reported due to *B. abortus*. Epidemiologists and public health officials have offered various reasons why *B. abortus* has never caused any sizable epidemics such as *B. suis* and *B. melitensis* have in the past, the most commonly advanced reason being that *B. abortus* was less virulent and invasive for man than *B. suis* and *B. melitensis*. This disease outbreak does not support that view but does present evidence that *B. abortus* can be the cause of an epidemic when the bacteria are present in large numbers and are not diluted by clean milk. The spread of brucellosis through milk can be stopped by the eradication of brucellosis in cattle and the pasteurization of all milk supplies.

---

[1] From Veterinary Public Health Division, Communicable Disease Center, United States Public Health Service, Atlanta, Ga., and Maryland Live Stock Sanitation Board.

DEATHS DURING WEEK ENDED JAN. 3, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Jan. 3, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	10,418	10,209
Median for 3 prior years	10,209	
Deaths under 1 year of age	716	814
Median for 3 prior years	644	
Data from industrial insurance companies:		
Policies in force	66,888,938	67,259,940
Number of death claims	7,715	10,044
Death claims per 1,000 policies in force, annual rate	6.0	7.8

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JANUARY 10, 1948

Summary

In the absence of any sharp localized increase in cases of influenza, the increase in reported cases from 7,315 last week to 10,335 is probably of no great epidemic significance, although the current figure is also above the 5-year (1943–47) median (4,587). States reporting the largest numbers of cases are as follows: *Increases*—Texas (2,966 to 4,712), California (315 to 1,272), Arizona (601 to 849), Arkansas (212 to 452), Alabama (83 to 277), and Virginia (839 to 849); the incidence in South Carolina declined from 1,350 to 916.

The number of cases reported since the seasonal low point of the disease affords a good comparative picture of the seasonal incidence to date. Cases reported since seasonal low (week ended between July 26 and August 1) are as follows:

Season:	*Number of cases*	Season:	*Number of cases*
1947–48	53, 893	1944–45	35, 166
1946–47	36, 640	1943–44	467, 692
1945–46	410, 289	1942–43	33, 328

A total of 41 cases of poliomyelitis was reported, as compared with 46 last week. New York reported 9 cases, Idaho and California 4 each, and no other State reported more than 3 cases.

Of 4 cases of smallpox, 2 occurred in Kansas and 1 each in Indiana and Missouri. Measles cases increased from 5,302 to 7,236, and whooping cough from 1,796 to 2,417. Diphtheria declined from 282 cases last week to 258 (366 corresponding week last year, also the 5-year median).

"Q" fever has been reported identified in Phoenix, Ariz.

Deaths, all causes, in 93 large cities in the United States increased from 10,418 to 11,313, probably reflecting increased mortality from respiratory complications. The figure for the corresponding week last year was 10,638, and for 1946 it was 11,670. Infant deaths in these cities increased from 725 last week to 822 for the current week.

Telegraphic morbidity reports from State health officers for the week ended January 10, 1948, and comparison with corresponding week of 1947 and 5-year median*

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended— Jan. 10, 1948	Week ended— Jan. 4, 1947	Median, 1943-47	Week ended— Jan. 10, 1948	Week ended— Jan. 4, 1947	Median, 1943-47	Week ended— Jan. 10, 1948	Week ended— Jan. 4, 1947	Median, 1943-47	Week ended— Jan. 10, 1948	Week ended— Jan. 4, 1947	Median, 1943-47
NEW ENGLAND												
Maine	1	3	0	------	1	1	2	260	25	0	1	2
New Hampshire	0	0	0	------	1	3	2	10	6	0	0	0
Vermont	0	0	0	------	------	24	49	126	18	0	0	0
Massachusetts	5	21	7	------	------	------	242	247	247	2	3	8
Rhode Island	0	0	0	------	------	25	------	16	7	0	0	0
Connecticut	1	0	1	------	2	11	14	84	32	3	0	2
MIDDLE ATLANTIC												
New York	19	25	15	[1] 1	[1] 8	[1] 17	595	112	316	8	4	22
New Jersey	2	4	3	2	4	27	736	120	120	2	1	15
Pennsylvania	4	11	13	(2)	[2] 4	[2] 7	392	778	778	4	1	10
EAST NORTH CENTRAL												
Ohio	2	18	18	6	5	16	348	211	40	3	6	10
Indiana	8	21	13	14	23	31	306	18	38	2	0	4
Illinois	2	3	10	1	4	13	1,181	23	169	9	6	9
Michigan [3]	5	5	3	2	------	1	422	126	52	1	4	4
Wisconsin	2	4	4	23	33	62	187	77	77	2	2	2
WEST NORTH CENTRAL												
Minnesota	7	9	4	------	------	------	398	6	6	0	0	1
Iowa	2	0	5	------	------	2	157	1	21	0	4	3
Missouri	5	8	3	9	1	6	29	6	24	0	2	7
North Dakota	0	3	3	1	2	25	34	2	1	1	1	1
South Dakota	0	0	1	------	------	------	13	7	10	0	1	1
Nebraska	1	0	4	21	------	60	7	1	12	1	1	1
Kansas	6	3	4	62	36	36	10	4	46	2	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	30	------	2	0	0	0
Maryland [3]	18	14	10	------	5	9	11	10	10	1	0	6
District of Columbia	0	0	0	------	1	5	44	15	9	2	2	2
Virginia	9	3	5	849	615	659	78	86	85	1	1	9
West Virginia	5	12	3	112	65	65	350	22	22	4	6	5
North Carolina	14	8	13	------	------	------	6	160	53	4	2	8
South Carolina	13	18	7	916	789	789	33	45	45	0	6	6
Georgia	6	18	13	48	12	181	13	89	19	0	0	2
Florida	7	6	6	4	7	7	26	1	8	0	0	2
EAST SOUTH CENTRAL												
Kentucky	7	21	4	3	3	3	9	------	66	4	2	4
Tennessee	6	16	10	168	22	89	37	8	39	3	1	6
Alabama	8	8	8	277	69	413	8	27	9	2	2	4
Mississippi [3]	7	14	13	43	------	------	21	------	------	1	3	3
WEST SOUTH CENTRAL												
Arkansas	6	1	7	452	53	179	50	13	13	1	1	1
Louisiana	3	18	9	135	3	21	5	11	11	0	1	2
Oklahoma	7	2	5	124	90	171	8	10	10	2	1	3
Texas	24	27	48	4,712	1,431	2,250	524	25	90	7	8	9
MOUNTAIN												
Montana	4	1	1	12	44	44	87	70	38	0	0	0
Idaho	0	1	1	46	19	17	5	4	24	1	0	1
Wyoming	0	0	1	------	14	14	19	2	3	0	0	0
Colorado	4	8	6	99	22	45	59	2	59	1	2	2
New Mexico	3	1	3	------	2	1	------	8	3	1	0	1
Arizona	2	7	3	849	209	209	3	64	7	0	0	1
Utah [3]	3	0	0	3	28	32	13	10	14	0	1	1
Nevada	0	0	0	------	------	------	------	------	4	0	0	0
PACIFIC												
Washington	2	10	10	1	------	------	162	20	25	1	0	2
Oregon	8	3	3	68	25	25	21	29	54	0	0	7
California	20	11	30	1,272	13	35	490	29	210	9	6	21
Total	258	366	366	10,335	3,665	4,587	7,236	2,995	2,995	85	83	238
Seasonal low week [4]	(27th) July 5-11			(30th) July 26-Aug. 1			(35th) Aug. 30-Sept. 5			(37th) Sept. 13-19		
Total since low	6,616	7,932	8,771	53,893	36,640	36,640	42,182	25,882	28,893	867	1,055	1,695

*For the purpose of weekly comparisons of these reports over a period of years, the first week of the year is taken to be that week which has four or more days of the new year. Thus there may be a maximum difference of six days between the dates of comparable weeks of two years.

[1] New York City only. [2] Philadelphia only. [3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended January 10, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47
	Jan. 10, 1948	Jan. 4, 1947		Jan. 10, 1948	Jan. 4, 1947		Jan. 10, 1948	Jan. 4, 1947		Jan. 10, 1948 [5]	Jan. 4, 1947	
NEW ENGLAND												
Maine	0	1	0	19	48	35	0	0	0	0	0	0
New Hampshire	0	1	0	2	7	6	0	0	0	0	0	0
Vermont	1	1	0	8	12	5	0	0	0	0	0	0
Massachusetts	0	0	0	96	144	261	0	0	0	0	3	1
Rhode Island	0	0	0	8	10	12	0	0	0	0	0	0
Connecticut	0	0	0	12	26	49	0	0	0	0	0	1
MIDDLE ATLANTIC												
New York	9	4	4	209	226	329	0	0	0	1	1	2
New Jersey	1	1	1	51	94	76	0	0	0	0	0	0
Pennsylvania	0	3	0	181	113	197	0	0	0	9	2	3
EAST NORTH CENTRAL												
Ohio	0	1	1	249	284	284	0	1	0	0	4	3
Indiana	3	5	1	63	103	103	1	1	1	0	2	1
Illinois	2	2	0	129	129	213	0	0	0	0	1	2
Michigan [3]	0	1	0	85	165	66	0	0	0	0	1	0
Wisconsin	0	13	1	59	69	145	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	0	0	0	54	32	53	0	0	0	0	0	0
Iowa	2	2	0	38	17	53	0	0	0	0	0	0
Missouri	0	2	1	35	35	52	1	0	0	0	0	0
North Dakota	0	0	0	6	6	11	0	0	0	0	0	0
South Dakota	0	1	0	7	16	38	0	0	0	0	1	0
Nebraska	1	1	0	21	10	33	0	0	0	0	0	0
Kansas	1	4	0	22	25	80	2	0	0	0	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	8	6	6	0	0	0	0	0	0
Maryland [3]	0	0	0	44	19	43	0	0	0	0	0	1
District of Columbia	0	0	0	13	4	15	0	0	0	0	0	0
Virginia	0	2	1	38	25	55	0	0	0	2	0	1
West Virginia	0	0	0	19	16	40	0	0	0	0	1	1
North Carolina	0	3	0	29	37	78	0	0	0	0	1	0
South Carolina	1	0	0	2	26	12	0	0	0	0	1	1
Georgia	0	3	1	21	9	14	0	0	0	3	1	1
Florida	2	1	0	10	10	8	0	0	0	6	0	0
EAST SOUTH CENTRAL												
Kentucky	1	0	0	34	40	40	0	0	0	2	2	1
Tennessee	1	0	0	57	15	49	0	0	0	1	1	1
Alabama	1	1	0	26	19	22	0	0	0	0	0	0
Mississippi [3]	0	1	1	9	4	13	0	1	0	1	1	0
WEST SOUTH CENTRAL												
Arkansas	0	0	1	1	3	6	0	0	0	0	0	1
Louisiana	0	3	1	2	4	10	0	0	0	1	4	2
Oklahoma	0	3	1	14	6	25	0	0	0	0	0	0
Texas	2	3	4	53	26	83	0	0	0	11	1	5
MOUNTAIN												
Montana	0	0	0	22	5	13	0	0	0	2	0	0
Idaho	4	0	0	7	13	13	0	0	1	0	2	0
Wyoming	0	0	0	3	5	7	0	0	0	0	0	0
Colorado	0	2	0	40	30	30	0	0	0	0	1	1
New Mexico	0	0	0	9	6	6	0	0	0	0	0	0
Arizona	0	0	1	6	8	10	0	0	0	0	2	0
Utah [3]	0	1	1	27	20	43	0	0	0	0	0	0
Nevada	0	0	0	2	0	0	0	0	0	0	0	0
PACIFIC												
Washington	2	1	3	31	42	45	0	0	0	0	1	1
Oregon	3	0	0	18	25	25	0	0	0	2	1	0
California	4	12	10	98	86	203	0	0	0	4	2	1
Total	41	79	52	1,997	2,080	3,457	4	3	8	45	38	40
Seasonal low week [4]	(11th) Mar. 15-21			(32d) Aug. 9-15			(35th) Aug. 30-Sept. 5			(11th) Mar. 15-21		
Total since low	10,252	24,876	13,394	24,536	28,766	41,778	25	57	95	3,454	3,566	4,608

---

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately as follows: Georgia 2; Florida 1; Texas 5; Oregon 1; California 4.

Telegraphic morbidity reports from State health officers for the week ended January 10, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Jan. 10, 1948	Whooping cough: Week ended— Jan. 4, 1947	Whooping cough: Median, 1943-47	Week ended January 10, 1948: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	81	14	19								
New Hampshire	8										
Vermont	69	4	17								1
Massachusetts	140	118	118	1							
Rhode Island	18	11	11		2						
Connecticut	45	10	31								1
MIDDLE ATLANTIC											
New York	156	166	167	1			1				4
New Jersey	76	94	91	1							2
Pennsylvania	80	158	141						1		4
EAST NORTH CENTRAL											
Ohio	85	86	86			2					
Indiana	48	15	15								1
Illinois	62	70	70	2	6		2		2		9
Michigan [3]	90	228	43	1							3
Wisconsin	116	134	86				1		1		4
WEST NORTH CENTRAL											
Minnesota	87	1	28								4
Iowa	9	5	6	1							
Missouri	23	11	11			1			5		3
North Dakota	7	1	1								
South Dakota	7	1	1								1
Nebraska	26	3	3	1							1
Kansas	56	19	22						1		1
SOUTH ATLANTIC											
Delaware	1	4	4								
Maryland [3]	43	40	40						4		
District of Columbia	7	6	6						1		
Virginia	115	75	61			72			5		1
West Virginia	13	10	18								
North Carolina	32	13	71	1				1			1
South Carolina	66	62	63	1	4				2	3	1
Georgia	17	8	8		1				4	2	
Florida	18	9	9	2						3	
EAST SOUTH CENTRAL											
Kentucky	12	46	20								1
Tennessee	36	9	12			3			9	1	1
Alabama	29	15	15						1	3	1
Mississippi [3]	6			2					1		
WEST SOUTH CENTRAL											
Arkansas	57	23	22	1		4					
Louisiana	11	1	2	2					1		
Oklahoma	16		5	1							
Texas	371	139	145	16	395	462			1	8	5
MOUNTAIN											
Montana	3	1	7								
Idaho	29	5	3								2
Wyoming	2	1	5	1					1		
Colorado	82	6	17								9
New Mexico	23	1	2		10						
Arizona	29	23	22			42					
Utah [3]	14	3	12								4
Nevada			1								
PACIFIC											
Washington	5	6	21								1
Oregon	9	12	13								1
California	82	79	98	4	3		1				3
Total	2,417	1,746	1,746	39	421	586	5	1	40	20	70
Same week: 1947	1,746			37	322	473	4	1	51	37	86
Median, 1943-47	1,746			22	322	101	6	0	39	67	[6] 55

[3] Period ended earlier than Saturday. [6] 3-year median, 1945-47.

Alaska: Reports no cases of these communicable diseases.

Territory of Hawaii, week ended Jan. 10, 1948: Amebic dysentery 1, bacillary dysentery 6, influenza 1, measles 2, whooping cough 31.

WEEKLY REPORTS FROM CITIES*

City reports for week ended January 3, 1948

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	1	0	1	0	2	0	0	8
New Hampshire:												
Concord	0	0	------	0	------	0	2	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	7	0	------	0	87	1	17	0	30	0	0	20
Fall River	0	0	------	0	------	0	0	0	0	0	0	6
Springfield	0	0	------	0	------	0	1	0	2	0	0	5
Worcester	0	0	------	0	------	0	10	1	7	0	0	5
Rhode Island:												
Providence	0	0	------	0	------	0	0	0	1	0	0	10
Connecticut:												
Bridgeport	0	0	------	0	4	0	0	0	0	0	0	------
Hartford	0	0	------	0	1	0	0	0	3			7
New Haven	0	0	------	6	------	3	2	0	1	0	0	1
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0	------	0	------	1	5	0	3	0	0	15
New York	12	1	5	2	183	4	88	0	50	0	1	18
Rochester	0	0	------	1	------	0	2	2	5	0	0	2
Syracuse	1	0	------	0	------	0	1	0	5	0	0	6
New Jersey:												
Camden	0	0	------	0	------	1	6	0	1	0	0	------
Newark	0	0	------	0	2	0	1	0	7	0	0	2
Trenton	0	0	------	0	3	0	2	0	0	0	0	------
Pennsylvania.												
Philadelphia	2	0	7	4	28	2	15	0	30	0	1	14
Pittsburgh	1	0	2	2	2	0	18	0	10	0	1	6
Reading	0	0	------	0	2	0	3	0	3	0	0	2
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	1	0	1	0	9	1	4	0	9	0	0	------
Cleveland	1	0	3	1	2	0	4	0	14	0	0	23
Columbus	0	0	1	1	53	0	6	0	5	0	0	8
Indiana:												
Fort Wayne	0	0	------	0	2	0	5	0	4	0	0	------
Indianapolis	2	1	------	0	17	1	1	0	5	0	0	1
South Bend	0	0	------	0	------	0	0	0	0	0	0	------
Terre Haute	0	0	------	0	4	0	2	0	0	0	0	1
Illinois:												
Chicago	0	0	------	0	284	4	28	0	33	0	0	11
Michigan:												
Detroit	1	0	------	0	4	0	12	0	23	0	1	24
Flint	0	0	------	0	1	0	0	0	2	0	0	------
Grand Rapids	0	0	------	0	90	0	2	0	4	0	0	5
Wisconsin:												
Kenosha	0	0	------	0	5	0	0	0	0	0	0	------
Milwaukee	0	0	2	2	2	0	5	0	6	0	0	6
Racine	0	0	------	0	1	0	2	0	1	0	0	2
Superior	0	0	------	0	------	0	0	0	3	0	0	1
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	1	0	0	0	7	0	0	14
Minneapolis	0	0	------	0	62	1	6	0	17	0	0	10
St. Paul	1	0	------	0	4	0	6	0	4	0	0	5
Missouri:												
Kansas City	0	0	8	0	1	1	9	0	4	0	0	15
St. Joseph	0	0	------	0	------	0	0	0	2	0	0	------
St. Louis	2	0	------	1	13	1	5	0	11	0	0	5

---

* In some instances the figures include nonresident cases.

City reports for week ended January 3, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	0	-------	0	3	0	3	0	0	------
Kansas:												
Topeka	0	0	------	0	-------	0	3	0	1	0	0	1
Wichita	0	0	------	0	1	0	2	0	1	0	0	3
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	5	0	5	0	4	0	0	------
Maryland:												
Baltimore	0	0	1	0	0	0	3	0	4	0	1	20
Cumberland	12	0	------	0	-------	0	2	0	2	0	0	------
Frederick	0	0	------	0	-------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	1	0	70	0	9	0	7	0	0	14
Virginia:												
Lynchburg	0	0	------	0	-------	0	2	0	1	0	0	8
Richmond	0	0	------	0	-------	0	5	0	4	0	0	1
Roanoke	0	0	------	0	1	0	0	0	0	0	0	-----
West Virginia:												
Charleston	0	0	------	0	-------	0	0	0	0	0	0	-----
Wheeling	0	0	------	0	1	0	1	0	0	0	0	2
North Carolina:												
Raleigh	0	0	------	0	-------	0	3	0	0	0	0	1
Wilmington	2	0	------	0	1	0	4	0	0	0	0	1
Winston-Salem	0	0	------	0	-------	0	2	0	4	0	0	------
South Carolina:												
Charleston	0	0	120	0	-------	0	1	0	2	0	0	2
Georgia:												
Atlanta	0	0	24	0	-------	0	1	0	2	0	0	1
Brunswick	0	0	------	0	-------	0	2	0	0	0	0	-----
Savannah	0	0	------	0	-------	0	1	0	0	0	0	2
Florida:												
Tampa	3	0	------	0	3	0	7	0	1	0	0	------
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	4	0	------	1	8	0	8	1	0	0	1	1
Nashville	0	0	------	0	-------	0	2	0	1	0	0	------
Alabama:												
Birmingham	1	0	------	0	1	0	5	0	3	0	0	------
Mobile	0	0	15	2	-------	0	2	0	1	0	0	5
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	1	0	------	0	-------	0	0	0	1	0	0	------
Louisiana:												
New Orleans	3	0	4	1	-------	0	5	0	1	0	0	2
Shreveport	0	0	------	0	-------	0	5	0	0	0	0	-----
Oklakoma:												
Oklahoma City	0	0	------	0	-------	0	1	0	6	0	0	1
Texas:												
Dallas	1	0	------	0	1	0	4	0	3	0	0	5
Galveston	0	0	------	1	-------	0	6	0	0	0	0	------
Houston	5	0	------	2	1	1	9	0	2	0	0	2
San Antonio	0	0	1	0	-------	0	8	0	0	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	25	0	0	0	0	0	0	------
Great Falls	0	0	------	0	2	0	1	0	0	0	0	------
Helena	0	0	------	0	-------	0	0	0	0	0	0	-----
Missoula	0	0	------	0	-------	0	0	0	0	0	0	4
Idaho:												
Boise	0	0	------	0	-------	0	2	0	0	0	0	------
Colorado:												
Denver	0	0	5	0	9	0	3	0	8	0	0	28
Pueblo	0	0	------	0	-------	0	1	0	4	0	0	27
Utah:												
Salt Lake City	0	0	------	1	15	0	1	1	1	0	0	------

City reports for week ended January 3, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	1	0	------	0	------	0	2	2	2	0	0	9
Spokane	0	0	------	0	1	0	2	1	0	0	0	4
Tacoma	0	0	------	0	34	0	0	0	0	0	0	------
California:												
Los Angeles	1	0	174	3	18	2	3	0	5	0	0	12
Sacramento	0	0	1	1	1	0	3	1	0	0	0	------
San Francisco	0	0	------	0	51	1	6	0	3	0	0	1
Total	66	2	375	26	1,117	25	406	9	391	0	6	415
Week ended Jan. 4, 1947[1]	92	------	52	16	881	------	408	------	468	0	5	498
Average 1943-47[1]	76	------	1,443	[2] 52	[3]1,505	------	[2] 497	------	921	0	9	589

[1] Exclusive of Oklahoma City.
[2] 3-year average, 1945-47.
[3] 5-year median, 1943-47.

Dysentery, amebic.—Cases: Boston 1; New York 6; New Orleans 3; Los Angeles 1.
Dysentery, bacillary.—Cases: Los Angeles 2.
Dysentery, unspecified.—Cases: San Antonio 2.
Rocky Mountain spotted fever.—Cases: Baltimore 1.
Tularemia.—Cases: Cleveland 2; St. Louis 1; New Orleans 1.
Typhus fever, endemic.—Cases: New York 1; Tampa 1; Nashville 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (latest available estimated population, 34,530,200)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	18.3	0.0	0.0	0.0	243	10.5	86.3	2.6	120	0.0	0.0	162
Middle Atlantic	7.9	0.5	6.5	4.2	102	3.7	65.3	0.9	53	0.0	1.4	30
East North Central	3.1	0.6	4.3	2.5	291	3.7	43.5	0.0	67	0.0	0.6	50
West North Central	6.0	0.0	16.1	2.0	165	6 0	68.4	0.0	101	0.0	0.0	107
South Atlantic	27.8	0.0	238.6	0.0	132	0.0	78.5	0.0	51	0.0	1.6	85
East South Central	29.5	0.0	88.5	17.7	53	0.0	100.3	5.9	30	0.0	5.9	35
West South Central	25.4	0.0	12.7	10.2	5	2.5	96.5	0.0	33	0.0	0.0	25
Mountain	0.0	0.0	39.7	7.9	405	0.0	63.5	7.9	103	0.0	0.0	469
Pacific	3.2	0.0	276.8	6.3	166	4.7	25.3	6.3	16	0.0	0.0	41
Total	10.0	0.3	56.8	3.9	169	3.8	61.5	1.4	59	0.0	0.9	63

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—A rat found dead on November 26, and another rat found dead on November 28, 1947, both in Kukuihaele area, Hamakua District, Island of Hawaii, T. H., have been proved positive for plague.

Panama Canal Zone

Notifiable diseases—November 1947.—During the month of November 1947, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Residence[1]									
	Panama City		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	5						2		7	
Diphtheria	28	1			1		13	2	42	3
Dysentery:										
Amebic	2				1		2	1	5	1
Bacillary	2		1		5		1	1	9	1
Leprosy							1		1	
Malaria[2]	9		2		5		207	8	223	8
Measles					1				1	
Meningitis, meningococcus	1						1		2	
Pneumonia		12		3	14	2		5	[3] 14	22
Tuberculosis		23		7	12			7	[3] 12	37
Typhoid fever							1	1	1	1

---

[1] If place of infection is known, cases are so listed instead of by residence.

[2] 13 recurrent cases.

[3] In the Canal Zone only.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended December 20, 1947.—During the week ended December 20, 1947, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		39	6	206	489	33	61	124	108	1,066
Diphtheria				7	12	3	1		1	24
Dysentery:										
Amebic					2					2
Bacillary					2					2
German measles		1		5	15	3		6	8	38
Influenza		7			17				5	29
Measles		2	1	210	399	19	4	6	55	696
Meningitis, meningococcus					2					2
Mumps		19	1	149	206	27	76	68	35	581
Poliomyelitis		2			4	1	11		1	19
Scarlet fever		5	7	67	98	5	2		10	194
Tuberculosis (all forms)		5	6	71	63	4	9	12	101	271
Typhoid and paratyphoid fever				5	4				3	12
Undulant fever									1	1
Venereal diseases:										
Gonorrhea		9	14	61	69	29	23	69	112	386
Syphilis		9	7	61	46	10	5	7	43	188
Other forms									4	4
Whooping cough			1	25	86	17	3	89	29	250

JAPAN

Notifiable diseases—4 weeks ended November 29, 1947, and accumulated totals for the year to date.—For the 4 weeks ended November 29, 1947, and for the year to date, certain notifiable diseases were reported in Japan as follows:

Disease	4 weeks ended Nov. 29, 1947		Total reported for the year to date	
	Cases	Deaths	Cases	Deaths
Diphtheria	2,350	191	26,382	2,167
Dysentery, unspecified	702	250	39,001	7,292
Encephalitis, Japanese "B"	[1] 1	[1] 1	[2] 252	[1] 131
Gonorrhea	15,938		196,527	
Influenza	165		2,886	
Malaria	363	2	11,541	23
Measles	2,506		462,842	
Meningitis, epidemic	72	34	3,277	1,072
Paratyphoid fever	211	18	4,529	260
Pneumonia	6,636		[3] 107,756	
Scarlet fever	233	5	2,452	57
Smallpox	3	0	390	38
Syphilis	11,672		135,142	
Tuberculosis	22,183		268,699	
Typhoid fever	872	147	17,125	2,139
Typhus fever	17	0	1,035	83
Whooping cough	2,881		126,055	

[1] Suspected.

[2] Suspected; diagnosis confirmed in 7 cases.

[3] For the period Mar. 30 to Nov. 29, 1947.

NEW ZEALAND

Notifiable diseases—4 weeks ended November 29, 1947.—During the 4 weeks ended November 29, 1947, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	13	1	Ophthalmia neonatorum	1	
Diphtheria	35	1	Poliomyelitis	26	
Dysentery:			Puerperal fever	5	
Amebic	3		Scarlet fever	61	
Bacillary	9		Tetanus	1	1
Erysipelas	6		Tuberculosis (all forms)	202	56
Food poisoning	1		Typhoid fever	50	1
Lethargic encephalitis	1		Undulant fever	9	

NORWAY

Notifiable diseases—September 1947.—During the month of September 1947, cases of certain notifiable diseases were reported in Norway as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	17	Mumps	433
Diphtheria	74	Paratyphoid fever	16
Dysentery	12	Pneumonia (all forms)	982
Epidemic encephalitis	8	Poliomyelitis	176
Erysipelas	518	Rheumatic fever	122
Gastroenteritis	7, 106	Scabies	3, 484
Gonorrhea	609	Scarlet fever	371
Hepatitis, epidemic	263	Syphilis	131
Impetigo contagiosa	4, 319	Tuberculosis (all forms)	331
Influenza	1, 639	Typhoid fever	3
Laryngitis	6, 788	Weil's disease	1
Malaria	1	Whooping cough	481
Measles	43		

SWITZERLAND

Notifiable diseases—July–September 1947.—For the months of July, August, and September 1947, cases of certain notifiable diseases were reported in Switzerland as follows:

Disease	July	August	September	Disease	July	August	September
Cerebrospinal meningitis	9	9	1	Mumps	107	38	72
Chickenpox	179	74	83	Paratyphoid fever	17	59	30
Diphtheria	303	272	401	Poliomyelitis	153	210	136
Dysentery	6	1	8	Scarlet fever	345	316	568
Hepatitis, epidemic	30	35	45	Tuberculosis	380	283	327
Influenza	9	2	41	Typhoid fever	12	20	13
Lethargic encephalitis	1	1		Undulant fever	18	6	12
Malaria			1	Whooping cough	372	309	299
Measles	586	271	255				

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From consular reports, international health organizations, medical officers of the Public Health Service, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January-October 1947	November 1947	December 1947—week ended—			
				6	13	20	27
AFRICA							
Egypt	C	11,495	10,392	14	3		
Alexandria	C	150	53				
Cairo[1]	C	118	15				
Ismailiya	C	90	9				
Port Said	C	29	7				
Suez	C	20	1				
ASIA							
Arabia: Amirate of Dubay	C		1				
Burma	C	257	4		2		
Moulmein	C	64	2				
Rangoon	C	4					
China:							
Anhwei Province	C	6					
Chekiang Province	C	202					
Pingyang	C	140					
Wenchow	C	1					
Formosa (Island of)	C	14					
Fukien Province	C	16					
Foochow	C	2					
Honan Province	C	936					
Hunan Province	C	16					
Kiangsi Province	C	102					
Kiangsu Province	C	738					
Chinkiang	C	8					
Shanghai	C	53					
Tsingkiang	C	9					
Kwangtung Province	C	6					
Hong Kong	C	6					
Suiyuan Province	C	52					
Szechwan Province	C	5					
India	C	122,196	19,556	2,444	2,272		
Ahmadabad	C	27					
Allahabad	C	70					
Bombay	C	113	1				
Calcutta	C	4,389	176	33	26	35	45
Cawnpore	C	324	7		1		
Chittagong	C	32					
Lahore	C	1,888	264	16	4		
Lucknow	C	286	2				
Madras	C	11	14	2			
Nagpur	C	33	5				
New Delhi	C	35					
India (French):							
Chandernagor	C	35					
Karikal	C	4	11				
Pondicherry	C	37					
India (Portuguese)	C	28	23				
Indochina (French):							
Annam	C	20	6		11		
Cambodia	C	1,071	69			[2] 26	
Cochinchina	C	491	35			[2] 14	
Bien Hoa	C	7					
Chaudoc	C	1					
Cholon	C	33					
Giadinh	C	11					
Longxuyen	C	6					
Mytho	C	5	1				
Rachgia	C	22					
Saigon	C	135				1	
Vinh-long	C	8					
Laos	C	55					
Tonkin	C	67					
Siam (Thailand)	C	3,350	43				
Bangkok	C	777	1				
Straits Settlement: Penang	C	[3] 1					
Syria	C						[4] 45

---

[1] For the week ended Jan. 3, 1948, 1 case of cholera was reported in Cairo.
[2] For the period Dec. 1–20, 1947.
[3] Imported.
[4] For the period Dec. 20, 1947 to Jan. 3, 1948.

PLAGUE

[C indicates cases; D, deaths]

Place		January–October 1947	November 1947	December 1947—week ended—			
				6	13	20	27
AFRICA							
Belgian Congo	C	[1] 17		1	2	1	
British East Africa:							
Kenya	C	52	7		1		
Uganda	C	1					
Egypt: **Alexandria**	C	24					
Madagascar	C	[2] 205	18				
Mananjary	C	5					
Union of South Africa	C	[3] 25	9	4		1	3
ASIA							
Burma	C	1,256	4		14		
Bassein	C	[4] 2					
Mandalay	C	17					
Rangoon	C	19					
China:							
Chekiang Province	C	116	25				
Formosa (Island of)	C	1					
Fukien Province	C	700	25				
Amoy	C	13					
Foochow	C	31	9				
Kiangsi Province	C	214	75		116		
Nanchang	C	42	4				
Kiangsu Province	C	30					
Shanghai	C	28					
Kwangtung Province	C	77					
Yunnan Province	C	[5] 216	33				
India	C	70,431	2,804				
Indochina (French):							
Annam	C	81	5			3	
Cochinchina	C	31					
Java	C	38	1				
Korea	C	22					
Manchuria	D	[6] 100					
Palestine	C	39	3	1			
Siam (Thailand)	C	48	2				
Syria	C	6					
Turkey: Akcakale	C	19					
EUROPE							
Germany: East Prussia.[7]							
Portugal: Azores	C	4					
Turkey (see Turkey in Asia).							
NORTH AMERICA							
Canada.[8]							
SOUTH AMERICA							
Argentina:							
Cordoba Province	C	1					
Santa Fe Province	C	3					
Brazil: [9]							
Ceara State	C	2					
Minas Geraes State	C	7					
Parahyba State	C	3					
Pernambuco State	C	4					
Ecuador:							
Chimborazo Province	C	4					
Loja Province	C	20	2				
Peru:							
Ancash Department	C		1				
Lambayeque Department	C	10					
Libertad Department	C	20					
Lima Department	C	42	7				
Piura Department	C	[10] 78	1				
OCEANIA							
Hawaii Territory: Plague infected rats [11]		1	2				

[1] Includes 5 cases of pneumonic plague.

[2] Includes 64 cases of pneumonic plague.

[3] Includes 2 cases of pneumonic plague.

[4] Imported.

[5] Includes 12 cases of pneumonic plague.

[6] Period not specified.

[7] During June 1947, an outbreak of plague with high mortality occurred in Königsberg, East Prussia, Germany.

[8] For the period July 5 to Sept. 20, 1947, 6 lots of plague infected fleas from squirrels were reported in Alberta and Saskatchewan Provinces, Canada.

[9] In addition, 7 cases of plague were reported in Brazil for the period Jan. 1 to May 31, 1947, specific localities not being given.

[10] In addition 82 cases with 65 deaths in Ayabaca Province and 58 cases with 48 deaths in Huancabamba Province, all unconfirmed, were reported for the period September 1946 to March 1947.

[11] Plague infection was also reported in Hawaii Territory as follows: On Jan. 9, 1947, in a pool of 31 rats, on Mar. 20, 1947, in a pool of 32 fleas collected from 59 rats.

SMALLPOX

[C indicates cases; P, present]

Place		January–October 1947	November 1947	December 1947—week ended— 6	13	20	27
AFRICA							
Algeria	C	164	-------	-------	-------	-------	-------
Angola	C	241	-------	-------	-------	-------	-------
Basutoland	C	1	-------	-------	-------	-------	-------
Bechuanaland	C	38	-------	-------	-------	-------	-------
Belgian Congo	C	[1] 2,272	194	35	-------	-------	-------
British East Africa:							
Kenya	C	440	19	-------	-------	-------	-------
Nyasaland	C	1,356	398	-------	-------	-------	-------
Tanganyika	C	2,527	176	-------	30	-------	-------
Uganda	C	527	32	18	-------	-------	-------
Cameroon (French)	C	135	7	-------	-------	-------	-------
Dahomey	C	140	10	-------	-------	7	-------
Egypt	C	482	2	1	-------	-------	-------
Ethiopia	C	30	-------	-------	-------	-------	-------
French Equatorial Africa	C	9	3	-------	-------	-------	-------
French Guinea	C	408	19	-------	-------	-------	-------
Gambia	C	6	-------	-------	-------	-------	-------
Gold Coast	C	777	109	18	-------	-------	-------
Ivory Coast	C	2,515	201	-------	[2] 132	-------	-------
Liberia	C	37	-------	-------	-------	-------	-------
Libya	C	2,158	93	7	1	38	-------
Mauritania	C	23	-------	-------	-------	-------	-------
Morocco (French)	C	56	1	-------	[2] 3	-------	-------
Morocco (Int. Zone)	C	12	-------	-------	-------	-------	-------
Morocco (Spanish)	C	29	-------	-------	-------	-------	-------
Mozambique	C	3	-------	-------	-------	-------	-------
Nigeria	C	4,734	160	-------	-------	-------	-------
Niger Territory	C	2,480	96	-------	-------	-------	-------
Portuguese Guinea	C	3	-------	-------	-------	-------	-------
Rhodesia:							
Northern	C	60	18	3	-------	-------	-------
Southern	C	476	-------	-------	-------	-------	-------
Senegal	C	16	1	-------	-------	-------	-------
Sierra Leone	C	374	-------	-------	-------	-------	-------
Sudan (Anglo-Egyptian)	C	297	419	59	36	99	-------
Sudan (French)	C	379	14	-------	-------	-------	-------
Swaziland	C	10	-------	-------	-------	-------	-------
Togo (French)	C	87	-------	-------	-------	1	-------
Tunisia	C	810	206	-------	-------	-------	-------
Union of South Africa	C	503	P	-------	P	-------	-------
ASIA							
Arabia	C	1	-------	-------	-------	-------	-------
Burma	C	2,788	45	-------	6	-------	15
Ceylon	C	1	-------	-------	-------	-------	-------
China	C	2,937	98	14	27	40	45
India	C	47,095	2,160	-------	-------	-------	-------
India (French)	C	10	-------	-------	-------	-------	-------
India (Portuguese)	C	3	9	-------	-------	-------	-------
Indochina (French)	C	4,506	131	-------	-------	[3] 200	-------
Iran	C	82	111	-------	-------	-------	-------
Iraq	C	14	27	1	13	6	-------
Japan	C	387	3	-------	-------	-------	-------
Korea	C	125	-------	-------	-------	-------	-------
Lebanon	C	-------	1	-------	5	-------	15
Malay States (Federated)	C	3,650	297	-------	130	58	-------
Manchuria	C	7	-------	-------	-------	-------	-------
Netherland East Indies	C	-------	4	-------	-------	-------	-------
Portuguese Timor	C	32	-------	-------	-------	-------	-------
Siam (Thailand)	C	1,264	59	-------	-------	-------	-------
Straits Settlements	C	99	-------	-------	-------	-------	-------
Syria	C	3	2	-------	-------	7	-------
Turkey (see Turkey in Europe).							
EUROPE							
Belgium	C	[1] 23	-------	-------	-------	-------	-------
France	C	48	-------	-------	-------	-------	-------
Germany	C	12	-------	-------	-------	-------	-------
Great Britain: England and Wales	C	77	-------	-------	-------	-------	-------
Greece	C	10	-------	-------	-------	-------	-------
Irish Free State	C	[4] 1	-------	-------	-------	-------	-------
Italy	C	68	-------	-------	-------	-------	-------
Luxemburg	C	[1] 2	-------	-------	-------	-------	-------
Portugal	C	79	104	13	2	-------	-------
Spain	C	30	1	-------	-------	-------	-------
Switzerland	C	[4] 1	-------	-------	-------	-------	-------
Turkey	C	3	-------	-------	-------	-------	-------

See footnotes at end of table.

SMALLPOX—Continued

Place		January-October 1947	November 1947	December 1947—week ended—			
				6	13	20	27
NORTH AMERICA							
Guatemala	C	12					
Mexico	C	942					
Panama (Republic)	C	[4] 1					
SOUTH AMERICA							
Argentina	C	38					
Brazil	C	424	6				
Colombia	C	3,439	15				
Ecuador	C	[1] 1,682	650				
Paraguay	C	[1] 788	[1] 142				
Peru	C	369					
Uruguay	C	[1] 279					
Venezuela	C	[1] 4,493	[1] 294	[1] 54	[1] 45		

---

[1] Includes alastrim.
[2] For the period Dec. 1-10, 1947.
[3] For the period Dec. 1-20, 1947.
[4] Imported.

TYPHUS FEVER*

[C indicates cases; P, present]

AFRICA							
Algeria	C	197					
Basutoland	C	15					
Bechuanaland	C	1					
Belgian Congo	C	335	36	1			
British East Africa:							
Kenya [1]	C	26	3				
Uganda	C	2					
Egypt	C	118	12	1		4	
Eritrea	C	625	68	5	30		
Ethiopia	C	255					
French West Africa [2]	C	2					
Gold Coast	C	6					
Libya	C	309	2	3	5	5	
Morocco (French)	C	124	1				
Morocco (International Zone)	C	27					
Morocco (Spanish)	C	88					
Nigeria [1]	C	16	2				
Rhodesia:							
Northern	C	1					
Southern	C	1					
Senegal	C	2					
Sierra Leone	C	3					
Sudan (Anglo-Egyptian)	C	1					
Tunisia [1]	C	650	13				
Union of South Africa [1]	C	283	P		P		
ASIA							
Arabia [1]	C	2					
Burma	C	3					
Ceylon	C	2	1				
China [1] [3]	C	85	7		3		1
India	C	7					
Indochina (French)	C	69	7		1	1	
Iran	C	243	3				
Iraq	C	291	3	2	3	2	
Japan	C	1,016	19		21		
Java	C	1					
Korea	C	1,261					
Malay States (Federated) [1]	C	50					
Manchuria	C	12					
Palestine [1]	C	198	5				
Siam (Thailand)	C	4					
Straits Settlements [1]	C	7	3				
Syria	C	32					1
Trans-Jordan	C	20					
Turkey (see Turkey in Europe).							

See footnotes at end of table.

TYPHUS FEVER—Continued

Place		January–October 1947	November 1947	December 1947—week ended— 6	13	20	27
EUROPE							
Austria [1]	C	8					
Bulgaria	C	813	34	3			
Czechoslovakia	C	38	3	1			
France	C	4					
Germany	C	24	1		1	1	
Great Britain: Malta and Gozo [2]	C	22	2				
Greece [1]	C	339	32	5	9	11	
Hungary	C	588	11		2	3	
Italy	C	65	4				
Sicily	C	29					
Luxemburg	C		4	1			
Netherlands [1]	C	1	2				
Norway [2]	C	1					
Poland	C	466	32				
Portugal	C	4					
Rumania [1]	C	23,327	1,134				
Spain	C	161	23				
Switzerland [4]	C	6					
Turkey	C	519	86	11	11	19	12
Yugoslavia	C	192	11	2	6		
NORTH AMERICA							
Costa Rica [2]	C	101					
Cuba [2]	C	9					
Guatemala	C	316					
Jamaica [2]	C	37	4				
Mexico	C	1,625					
Nicaragua	C	2					
Panama Canal Zone	C	13					
Panama (Republic)	C	[4] 21					
Puerto Rico	C	51	1				
Virgin Islands [2]	C	2					
SOUTH AMERICA							
Argentina [1]	C	16					
Brazil	C	33	15	2	4	3	10
Chile [1]	C	398					
Colombia	C	2,024					
Curacao [2]	C	1					
Ecuador [1]	C	526	48				
Peru	C	1,050					
Venezuela [1]	C	161					
OCEANIA							
Australia [2]	C	151	12				
Hawaii Territory [2]	C	30	1			1	

*Reports from some areas are probably murine type, while others probably include both murine and louse-borne types.

[1] Includes murine type.

[2] Murine type.

[3] Information dated December 10, 1947, stated that 100 deaths from typhus fever daily had occurred in Sinkiang Province, China, and spreading in Tihwa.

[4] Includes imported cases.

YELLOW FEVER

[C indicates cases; D, deaths]

AFRICA							
Nigera: Ossiomo leper settlement	C						[1] 1
Sudan (French): Bamako	C	2	1				
SOUTH AMERICA							
Brazil:							
Bahia State	D	1					
Para State	D	1					
Colombia:							
Antioquia Department	C	[2] 7	1				
Boyaca Department	D	3	1				
Caldas Department	D	6	2				
Cundinamarca Department	D	2					
Intendencia of Meta	D	7	2				
North Santander Department	D	1					
Santander Department	D	29					
Tolima Department	D	3					
Peru: Huanuco Department	D	2					

[1] Suspected.

[2] Includes deaths used as cases.

X

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON: 1948

For sale by the Superintendent of Documents, Washington, D. C.

Price 10 cents. Subscription price $4.00 a year, Domestic, $5.25 Foreign.

Public Health Reports

VOLUME 63 FEBRUARY 6, 1948 NUMBER 6

TUBERCULOSIS CONTROL ISSUE NO. 24

IN THIS ISSUE

Editorial: Decline of Tuberculosis Mortality
Complement Fixation for Histoplasmosis I, II
Methods for Isolation of *H. Capsulatum*
Studies of Fungus Antigens II
Verification of the Diagnosis of Tuberculosis

U.S. PUBLIC HEALTH SERVICE
1798

CONTENTS

Page.

Editorial: Decline of tuberculosis mortality. Francis J. Weber 161

A complement fixation test for histoplasmosis.

I. Technic and preliminary results on aminal sera. Daniel J. Tenenberg and Arden Howell, Jr. 163

II. Preliminary results with human sera. Michael L. Furcolow, Ivan L. Bunnell and Daniel J. Tenenberg 169

The efficiency of methods for the isolation of *Histoplasma capsulatum.* Arden Howell, Jr. 173

Studies on fungus antigens. II. Preliminary report on the isolation of an immunologically active polysaccharide from histoplasmin. Forrest W. Cross and Arden Howell, Jr. 179

On the verification of the diagnosis of tuberculosis. C. Eugene Woodruff 184

Mechanism of immunity and allergy in tuberculosis. Professor J. K. Weissfeiler 190

INCIDENCE OF DISEASE

United States:

Reports from States for week ended January 17, 1948, and comparison with former years 191

Weekly reports from cities:

City reports for week ended January 10, 1948 195

Rates, by geographic divisions, for a group of selected cities 197

Territories and possessions:

Puerto Rico—Notifiable diseases—5 weeks ended January 3, 1948 197

Foreign reports:

Canada—Provinces—Communicable diseases—Week ended December 27, 1947 198

Jamaica—Notifiable diseases—5 weeks ended January 3, 1948 198

Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—

Plague 199

Smallpox 199

Yellow fever 199

Deaths during week ended January 10, 1948 199

Public Health Reports

Vol. 63 • FEBRUARY 6, 1948 • *No. 6**

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

EDITORIAL

DECLINE OF TUBERCULOSIS MORTALITY

It is a provocative fact that since Koch's discovery of the causative organism, the mortality of tuberculosis has consistently diminished. It is, indeed, almost as if the mere exposure of the *mycobacterium tuberculosis* in its insidious role had robbed it of some of its sting. As an explanation of the phenomenon of declining mortality, however, this is of course idle sophistry. We must therefore look elsewhere for feasible explanation.

The possibility that the human strain of the tubercle bacillus has suffered a decline in virulence is open to serious question as well; indeed, there is little evidence to admit of such a conjecture. It appears more likely that this decreasing mortality rate arises rather from some important change in the parasite's human host—or, to be more exact, some complex of change, of which the host's environment probably plays a part.

It is conceivable, for example, that the forces of natural selection have, over the course of centuries, operated in such a fashion as now to confront the tubercle bacillus with a more resistant host. Furthermore, improved socio-economic conditions, in this country at least, are believed by many students of the problem to have played a significant role, although the evidence here is largely presumptive.

Whether these factors are entirely responsible for the phenomenon of declining mortality, or whether other causative influences can be held more cogently related, is, of course, not precisely determinable at the present time. Nor is it easy to determine the exact influence exerted by the deliberate efforts which have been undertaken to control the disease since Koch made his historic discovery. Certainly, the declining death rate has accompanied the development and application of control measures; and it is noteworthy that even those areas deficient in control facilities have shared in the general decline, a fact for which several valid explanations have been advanced.

---

*This is the twenty-fourth of a series of special issues of PUBLIC HEALTH REPORTS devoted exclusively to tuberculosis control, which will appear the first week of each month. The series began with the March 1, 1946, issue. The articles in these special issues are reprinted as extracts from the PUBLIC HEALTH REPORTS. Effective with the July 5, 1946, issue, these extracts may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 10 cents a single copy. Subscriptions are obtainable at $1.00 per year; $1.25 foreign.

Whatever the specific causes of the current, salutary trend, however, and whatever their relative individual weight in the total process, it is a preeminent fact that current statistical data on tuberculosis mortality rates are not an index of current infection and morbidity. Nor, in fact, are they a measure of the effectiveness of current control efforts. They are merely the expression of the relative condition or state of these factors at some time in the recent past. In similar fashion, we may assume that the tuberculosis death rate of the future will reflect the present universe of environmental control and human resistance and susceptibility.

It becomes strikingly plain, then, that we today, to the extent that our epidemiological principles of control are sound, hold the key to future mortality in this country. We possess a priceless advantage, in that certain forces have converged to render tuberculosis vulnerable at this time. If we are to confirm and assure for the future the present encouraging trend of tuberculosis mortality—if, indeed, we are to hope to eliminate tuberculosis as a public health problem—we are duty-bound to effect the widest possible extension of controls now, when conditions appear to favor the success of our efforts. For if it is true that tuberculosis began its retreat during the infancy of a control movement in this country, may we not expect it to suffer ultimate defeat under the onslaught of a mature, well-integrated, and progressive control program?

One further factor renders the immediate prosecution of control measures urgent. Since we do not with certainty know the precise influence of the elements which have in the past affected tuberculosis mortality, we have no assurance that these elements will in the future conspire in the same way to contribute positively to its decline. There is no assurance, in short, that our present advantage is not temporary, for it is entirely within the realm of possibility that those factors over which we have no direct control may themselves undergo natural or artificial change. Lest such changes take the direction of the current epidemiological trend from our hands irrevocably, then, affirmative action must be taken promptly to consolidate and extend our tuberculosis control program in all areas of activity.

FRANCIS J. WEBER, *Medical Director,*
Chief, Tuberculosis Control Division

A COMPLEMENT FIXATION TEST FOR HISTOPLASMOSIS

I. Technic and Preliminary Results on Animal Sera[1]

By: Daniel J. Tenenberg, *Bacteriologist and* Arden Howell, Jr., *Senior Mycologist, United States Public Health Service*

A serological test for human histoplasmosis would be a valuable adjunct in the diagnosis of the disease and in the interpretation of the histoplasmin skin reaction. No references to such a test have been noted in the literature. The complement fixation test described in the present paper was devised to fit this need.

The first problem in the development of a complement fixation test is the selection of a proper antigen. Such an antigen should detect antibodies in infected animals, and antibodies reacting with this antigen should not be present in the serum of normal animals.

Materials and Methods.—Preliminary complement fixation studies were carried out using histoplasmin (lot H–15—1:100) as the antigen and the sera of experimentally inoculated guinea pigs as the source of antibodies.

The test conforms essentially with the Kolmer complement fixation test for syphilis (*1*) with the exception of the nature and volume of antigen and the volume of serum employed.

The materials and methods employed are as follows:

1. Histoplasmin antigen (*2*): 0.2 cc. of 1:100 dilution of lot H–15.
2. Serum: 0.2 cc. of undiluted and serial two-fold dilutions.
3. Guinea pig complement: 1.0 cc. containing 2 full units. The complement titration is performed in the presence of a test dose of the antigen.
4. Washed, fresh sheep red blood cells: 0.5 cc. of a 2 percent saline suspension.
5. Anti-sheep rabbit hemolysin: 0.5 cc. containing 2 units.
6. Saline: 0.85 percent C. P. NaCl in distilled water.
7. Kolmer test tubes, chemically clean.

A typical protocol is shown in table 1. It will be noted that the first four control tubes do not contain serum, and that three tubes are employed for a given dilution of each serum to be tested.

TABLE 1.—*Sample complement fixation protocol*

Tube	Volume in cc.								Purpose
	Serum	Antigen (histoplasmin 1:100)	Complement (2 full units)	Hemolysin (2 units)	Saline		Cells		
1	------	------	------	------	2.5	Mix. Incubate 6–8° C. for 15–18 hours followed by 15′ in water bath at 37° C.	0.5	Mix. Incubate in water bath at 37° C. for 1 hour and read	Cell suspension control.
2	------	------	1.0	0.5	1.0		0.5		Hemolytic system control.
3	------	0.2	1.0	0.5	0.8		0.5		Antigen anti-complementary control.
4	------	0.2	------	------	2.3		0.5		Hemolytic control of antigen.
5	0.2	------	------	------	2.3		0.5		Hemolytic control of serum.
6	0.2	------	1.0	0.5	0.8		0.5		Anti-complementary control of serum.
7	0.2	0.2	1.0	0.5	0.6		0.5		Test.

---

[1] From the Office of Field Studies, Tuberculosis Control Division.

Four-plus complement fixation was considered positive; three- or two-plus, doubtful; and one-plus or no fixation, negative.

In the anticomplementary titration, undiluted histoplasmin antigen (lot H–15) was not anticomplementary. In this titration the complement employed had previously been titrated in the absence of the antigen.

Complement fixation tests with the blood of experimentally inoculated guinea pigs.—In order to determine if histoplasmin (lot H–15) is a satisfactory antigen in the complement fixation test, a number of sera from twelve guinea pigs inoculated with viable *Histoplasma capsulatum* (1:100 saline suspension of the yeast phase injected intraperitoneally) were collected. These sera were not obtained earlier than 7 months after the inoculation of the animals. The sera of 9 of 12 experimentally inoculated guinea pigs showed some degree of complement fixation. Five of these sera gave complete fixation, four gave fixation complicated by some anticomplementary effect of the sera and three gave no fixation. These data are sufficient to show that complement-fixing antibodies to histoplasmin (1:100 lot H–15) are produced in guinea pigs inoculated with *Histoplasma capsulatum.*

Complement fixation tests with the blood of non-infected guinea pigs.—In order to rule out the presence of complement-fixing substances in normal sera, "normal" guinea pigs were bled. Sera obtained from 33 of these "normal" guinea pigs were all negative. Eight of these "normal" guinea pigs had been skin-tested repeatedly with histoplasmin and blastomycin with consistently negative skin-test reactions. The implication is that repeated skin tests with histoplasmin, in the dilutions employed, do not produce complement fixing antibodies to histoplasmin in uninoculated or uninfected animals.

Cross-reactions in the complement fixation test when histoplasmin and blastomycin are used as antigens.—Since positive blastomycin skin reactions have been described in *Histoplasma*-inoculated guinea pigs whose histoplasmin skin reactions were positive (*2*, *3*) it seemed desirable to investigate possible cross-reactions between these two antigens by the serological method.

A complement fixation test, employing blastomycin as the antigen, had to be devised. Merely changing the antigen in the above-described complement fixation test, substituting a 1:100 dilution of blastomycin (lot B–7) for histoplasmin, was satisfactory. Undiluted blastomycin was not anticomplementary. With this test, employing sera from thirteen guinea pigs which had been inoculated with viable *Blastomyces dermatitidis*, six sera gave some degree of complement fixation. Of these six sera which fixed complement, three gave four-plus fixation and three gave two-plus fixation. Control sera of 19 "normal" guinea pigs gave no complement fixation with blastomycin.

First, to investigate cross-reactions, complement fixation tests were performed in which were employed a 1:100 dilution of histoplasmin (lot H–15) and blastomycin (lot B–7) as antigens. The sera of three guinea pigs which had been inoculated with *Histoplasma,* and which had given four-plus fixation with histoplasmin, were chosen as the source of antibodies. The titers of these sera, with the two above antigens, are shown in table 2. As in the skin tests, the complement fixation test revealed cross-reactions. However, as in the skin tests (*2*), the complement fixation test with the homologous antigen (histoplasmin 1:100, lot H–15) was positive in higher serum titer than with the heterologous antigen (blastomycin 1:100, lot B–7), and the cross-reactions were eliminated by diluting the serum (table 2).

TABLE 2.—*Cross-reactions in the complement fixation test employing a 1:100 dilution of histoplasmin (lot H–15) and blastomycin (lot B–7) as antigens and the sera of* Histoplasma-*inoculated guinea pigs*

Serum guinea pig No.	Undiluted		Serum dilution							
			1: 2		1: 4		1: 8		1: 16	
	H–15	B–7	H–15	B–7	H–15	B–7	H–15	B–7	H–15	B–7
177	++++	++	++++	0	--------	--------	--------	--------	--------	--------
168	++++	++++	++++	++++	++++	+	--------	--------	--------	--------
191	++++	++++	++++	++++	++++	+++	++++	+	++++	0

H–15—Histoplasmin.
B–7—Blastomycin.
++++—Complete complement fixation.
0—No complement fixation.

Next, the histoplasmin (1:100 lot H–15) was tested with the six *Blastomyces* animals' sera which had shown complement-fixing antibodies for blastomycin. Of the three sera which produced four-plus fixation with blastomycin, one gave a two-plus fixation, and two gave no fixation with histoplasmin. None of the three sera which gave two-plus fixation with blastomycin gave any fixation with histoplasmin.

In order further to investigate the cross-reactions, various dilutions of the two antigens were tested against the pooled sera of guinea pigs which had been inoculated with *Histoplasma* and the pooled sera of guinea pigs which had been inoculated with *Blastomyces* (table 3).

Table 3 shows that the homologous antigen gives fixation in higher dilutions of serum than does the heterologous antigen. It also shows that a 1:100 dilution of either antigen is close to the minimal concentration of antigen necessary for fixation. Serum dilutions apparently are more effective than antigen dilutions in the elimination of cross-reactions.

The results of these experiments on cross-reactions indicate that with the two antigens studied the homologous reactions are stronger than the heterologous reactions. This is similar to the results of skin test cross-reactions (*2*). Further, they indicate that these two antigens, in a 1:100 dilution, are comparable in combining power in their respective homologous reactions.

TABLE 3.—*Results of complement fixation tests with various dilutions of pooled sera of* Histoplasma-*inoculated guinea pigs and pooled sera of* Blastomyces-*inoculated guinea pigs employing histoplasmin (H-15) and blastomycin (B-7) in various dilutions as antigens*

HISTOPLASMIN DILUTIONS

H-serum [1]	1:100	1:200	1:400	1:800	1:1600
1:2	++++	++	+	0	0
1:4	++++	0	0	0	0
1:8	++++	0	0	0	0
1:16	++	0	0	0	0

BLASTOMYCIN DILUTIONS

H-serum [1]	1:100	1:200	1:400	1:800	1:1600
1:2	++++	++	0	0	0
1:4	+	0	0	0	0
1:8	0	0	0	0	0
1:16	0	0	0	0	0

HISTOPLASMIN DILUTIONS

B-serum [2]	1:100	1:200	1:400	1:800	1:1600
1:2	AC	AC	AC	AC	AC
1:4	+	+	+	0	0
1:8	0	0	0	0	0

BLASTOMYCIN DILUTIONS

B-serum [2]	1:100	1:200	1:400	1:800	1:1600
1:2	AC	AC	AC	AC	AC
1:4	++++	++	0	0	0
1:8	++++	+	0	0	0

[1] H-serum indicates pooled sera from *Histoplasma*-inoculated guinea pigs.
[2] B-serum indicates pooled sera from *Blastomyces*-inoculated guinea pigs.
++++ Complete complement fixation. 0 No complement fixation. AC Anti-complementary.

DISCUSSION

The purpose of these investigations was to develop a complement fixation test for human histoplasmosis. In such a technic, the selection of a satisfactory antigen is the primary problem. It has been shown that a 1:100 dilution of lot H-15 histoplasmin, a culture filtrate of *H. capsulatum*, appears to be such an antigen, and that complement-fixing antibodies which will combine with this antigen are present in the sera of guinea pigs experimentally inoculated with *Histoplasma capsulatum* 7 months before the sera were obtained. No such complement-fixing antibodies are found in normal guinea pig sera.

Similarly, complement-fixing antibodies against lot B-7 blastomycin, a culture filtrate of *B. dermatitidis*, were found in the sera of guinea pigs which had been experimentally inoculated with *Blastomyces dermatitidis* several months previous to the time serum was obtained. Martin (*4*) has described a complement fixation test in blastomycosis, in which a saline syspension of *Blastomyces* is used as the antigen.

In both tests, cross-reactions between blastomycin and histoplasmin have been noted, as well as in the skin tests (*2,3*) in which these same antigens were employed. While it is obvious that these two antigens are closely related antigenically, in both skin and serological tests the homologous reactions were found to be stronger than the heterologous reactions. In the skin test it has been demonstrated (*2*) that if the critical *titer* of either antigen is employed, the percentage of cross-reaction is considerably reduced, and the antigens are relatively specific. In the complement fixation tests, it has been shown that the homologous reaction can be differentiated from the heterologous by the method of serial serum dilutions, as is shown in tables 2 and 3.

The results of the experiments reported above, which show some degree of cross-reaction between histoplasmin and blastomycin with sera of guinea pigs experimentally inoculated with either *Histoplasma capsulatum* or *Blastomyces dermatitidis* are not in agreement with the studies of Martin (*4*) who, in describing a complement fixation test for human blastomycosis, reported no cross-reaction with a crude suspension of *Histoplasma* tested with sera from three patients with blastomycosis. This may have been due to the fact that the antigen used by Martin was weaker in combining power than the histoplasmin (1:100 dilution of lot H–15) used in the experiments reported above. It has been shown, for example, (*2*) that various lots of histoplasmin differ considerably in their potency as skin-test antigens.

As previously noted, only the sera of 9 of 12 guinea pigs inoculated with *Histoplasma* showed complement-fixing antibodies for a 1:100 dilution of histoplasmin (lot H–15). However, the first sera from these experimental animals were not obtained until approximately 7 months after inoculation. Similarly, only the sera of 6 of 13 guinea pigs inoculated with *Blastomyces* showed complement-fixing antibodies for a 1:100 dilution of blastomycin (lot B–7). Perhaps a greater percentage of positive serological reactions would have been obtained had the animals been bled earlier. Experiments should be performed to elucidate this relationship of stages of infection, skin reactions, and serology.

It is possible that the complement-fixing antibodies differ from the substances which confer sensitivity to the skin. Also, positive serology may be subject to an interpretation different from that attached to skin sensitivity. It may be, for example, that serology in contrast to skin tests will be a means of differentiating between active, or recent, extensive infection on the one hand and inactive, or long-past infection on the other. There is some evidence to support this, in the tests performed on human sera (*5*).

A more concentrated antigen preparation might prove to be more satisfactory than the 1:100 dilution of antigen employed in the present paper. A 1:100 dilution of histoplasmin (H–15) and of blastomycin (B–7) represents approximately one antigenic unit. Since undiluted preparations of these antigens are not anticomplementary, more concentrated preparations than a 1:100 dilution can be employed. Also, purification and/or concentration of the active antigenic material in histoplasmin might result in stronger reactions with fewer cross-reactions.

SUMMARY

1. A complement fixation test for histoplasmosis is described. Preliminary results indicate that lot H–15 histoplasmin is a satisfactory antigen for detecting complement-fixing antibodies in guinea pigs experimentally inoculated with *Histoplasma capsulatum*.

2. Similarly, a complement fixation test for blastomycosis is described. Lot B–7 blastomycin is a suitable antigen to demonstrate complement-fixing antibodies in guinea pigs experimentally inoculated with *Blastomyces dermatitidis*.

3. Complement-fixing antibodies against both antigens may be present in the serum of *Histoplasma*- or *Blastomyces*- inoculated guinea pigs. However, fixation is stronger with the homologous than the heterologous antigen, and cross-reactions can be eliminated by serial serum dilutions.

4. Normal guinea pig sera do not give positive complement fixation with histoplasmin or blastomycin.

REFERENCES

(*1*) Kolmer, John A. and Boerner, Fred.: Approved laboratory technic. D. Appleton Century Co., New York-London (1945).

(*2*) Howell, Arden: Studies of fungus antigens. 1. Quantitative studies of cross-reactions between histoplasmin and blastomycin in guinea pigs. Pub. Health Rep. **62:** 631–651 (May 1947).

(*3*) Olson, B. J., Bell, J. A., and Emmons, C. W.: Studies of the role of fungi in pulmonary disease. 1. Cross-reactions of histoplasmin. Pub. Health Rep., **60:** 1383–1394 (1945).

(*4*) Martin, D. S.: Complement fixation in blastomycosis. J. Infect. Dis. **57:** 291–295 (1935).

(*5*) Furcolow, M. L., Bunnell, I. L. and Tenenberg, D. J.: A complement fixation test for histoplasmosis. II. Preliminary results with human sera. This issue, p. 169.

NOTE

After manuscript for this article had gone to press, the authors noted the two references to complement fixation tests for histoplasmosis listed below:

(*1*) Salvin, S. B.: Complement fixation studies in experimental histoplasmosis. Proc. Soc. Exp. Biol. and Med. **66:** 342 (Nov. 1947).

The paper reports details indicating that highly specific results are obtained in rabbits and humans using antigen from the yeastlike phase of *H. Capsulatum*.

(*2*) Miller, H. E., Keddie, S. M., Johnstone, H. G., and Bostick, W. L.: Histoplasmosis. Cutaneous and mucomembranous lesions, mycologic and pathologic observations. Arch. Derm. and Syph. **56:** 71[illegible]39 (Dec. 1947).

This paper reports a positive complement fixation test on the serum of one proved case. No data on controls are included.

A COMPLEMENT FIXATION TEST FOR HISTOPLASMOSIS

II. Preliminary Results with Human Sera[1]

By: MICHAEL L. FURCOLOW, *Surgeon,* IVAN L. BUNNELL, *S. A. Surgeon and* DANIEL J. TENENBERG, *Bacteriologist, United States Public Health Service*

The preceding article in this issue (*1*) describes a complement fixation test by means of which it was possible to demonstrate that antibodies which combine with histoplasmin occur in the sera of *Histoplasma*-inoculated guinea pigs and are absent from the sera of guinea pigs which had not been inoculated. The present paper reports the use of this test with human sera.

MATERIAL AND METHODS

The technic of the complement fixation test is similar to the Kolmer test for syphilis (*2*). Observed results are expressed in the customary notation of 4-plus, 3-plus, 2-plus, 1-plus and 0 (negative) fixation but for the purposes of the present paper, the results are summarized in 3 groups: *Positive,* complete, 4-plus, fixation; *Doubtful,* 3- and 2-plus fixation; *Negative,* 1-plus and 0 fixation. For a few persons tested, more than one serum was available and it is evident that some variation exists in the results obtained from repeated tests on sera drawn at different times from the same individual. Sufficient data for a study of variation in the degree of fixation, or changes in fixation with time, are not as yet available. Except where noted, the results reported in this paper are the highest degree of fixation observed.

The histoplasmin used as the antigen for the complement fixation test is the same, lot H–15, as has been used extensively for intradermal testing of human beings (*3*) (*4*). It has been titered for specificity and potency in experimentally inoculated guinea pigs (*5*).

Intradermal tuberculin and histoplasmin tests were done on a number of the persons whose complement fixation tests are reported here. The tuberculin (PPD–S) was furnished by Dr. Florence Seibert of the Henry Phipps Institute of Philadelphia, Pennsylvania. A dose of 0.0001 mg., in 0.1 cc. of diluent, was used. Histoplasmin skin tests were made with 0.1 cc. of a 1:1000 dilution of lot H–15. Reactions to both tuberculin and histoplasmin were considered positive if the induration measured 5 or more mm. in diameter at the 48-hour reading.

The 300 persons whose sera were tested were all residents of Missouri and Kansas, the majority of the Kansas City area. They were chosen to furnish an estimate of the frequency of the occurrence of complement-fixing antibodies in the sera of selected groups. Insofar as material was available for study, an attempt was made to test proved cases of histoplasmosis, various groups in which infection might be suspected, and groups in which, a priori, infection would not be expected.

---

[1] From the Office of Field Studies, Tuberculosis Control Division.

Table 1 shows the frequency of positive, doubtful, and negative complement fixation tests in four main groups of cases. Altogether, 34 or 11.4 percent of the sera of the total group of 300 persons showed the presence of complement-fixing antibodies. Fourteen, or 4.7 percent of the tests were classified as being positive, while 20 or 6.7 percent were designated as doubtful.

TABLE 1.—*Frequency of positive, doubtful and negative complement fixation tests in 4 groups of cases*

Group (see text for description)	Number in group	Positive (4-plus tests)		Doubtful (3- and 2-plus tests)		Negative (1-plus and 0 tests)	
		Number	Percent	Number	Percent	Number	Percent
Proved cases of histoplasmosis	9	6	66.7	2	22.2	1	11.1
Histoplasmin "converters"	13	2	15.4	1	7.7	10	76.9
Histoplasmin-positive, tuberculin-negative persons with unhealed pulmonary lesions (*4*)	36	6	16.7	4	11.1	26	72.2
Miscellaneous "control" cases	242	0	0	13	5.4	229	94.6
Total	300	14	4.7	20	6.7	266	88.6

Proved cases of histoplasmosis.—In the course of our work in Kansas City, it has been possible to obtain sera from 9 proved cases of histoplasmosis. *Histoplasma capsulatum* was isolated by cultures from 8 patients; in the 9th, (J. W.) cultures were not taken but it was possible to confirm the diagnosis by microscopic study of the parasitized liver, spleen and adrenal gland. Further details of these cases are given in table 2 which gives results of complement fixation tests, histoplasmin tests, and a notation as to whether the case was living or dead at the time of this report.

TABLE 2.—*Results of intradermal histoplasmin tests, complement fixation tests and related data on 9 proved cases of histoplasmosis* [1]

Case	Status	Histoplasmin skin test	Tested	Number of sera—Degree of complement fixation				
				4+	3+	2+	1+	0
CD	Living	Positive	3	3				
WB	do	do	6	4		1	1	
SP	do	do	3	2	[2] 1			
GM	do	do	3	3				
JG	Dead	do	4	[3] 2		1	1	
FT	do	do	4	2	1		1	
EW	do	Negative	1					1
PP	do	do	2		1		1	
JW	do	do	1	1				

[1] For further description of these cases see (*6*).

[2] This serum showed some anticomplementary effect.

[3] One serum showed some anticomplementary effect.

According to the results shown, complement fixation, either 4-plus or 3-plus, was obtained on at least one serum from 8 of the 9 cases. There is some indication of a correlation between results of the skin and the complement fixation tests—6 of the 9 had positive reactions to both histoplasmin and complement fixation tests and the one person negative to the complement fixation test was also one of the 3 nonreactors to histoplasmin. In the complement fixation test, the results with sera from human cases closely parallel those obtained with guinea-pigs inoculated with *Histoplasma* (*1*).

Histoplasmin "converters".—Periodic skin testing with histoplasmin has been carried out during the past year on a large group of Kansas City school children. In the course of this work definite changes from negative to positive histoplasmin skin reactions, similar to tuberculin conversions, have been observed. Since changes in the tuberculin reaction from negative to positive are generally agreed to be a consequence of tuberculous infection, it may be postulated that histoplasmin conversion is a result of recent infection with *Histoplasma.*

At the present time a number of children—histoplasmin converters—are being observed. Sera from 13 such cases, whose conversion occurred 7 to 9 months before drawing the sera, were tested for the presence of complement-fixing antibodies. Two of the 13 showed definite and one doubtful complement fixation. These results, though observed at a time after conversion which may not be optimal for the demonstration of antibodies, show that the recent acquisition of skin sensitivity to histoplasmin may be associated with the same type of serological response as is observed in proved *Histoplasma* infections. Further intensive studies of these cases are in progress. It is significant that none of the 13 show clinical evidence of disease.

Histoplasmin-positive, tuberculin-negative persons with unhealed pulmonary lesions.—Sera were obtained from a special group of 36 children and adults who form part of a larger group which has been under intensive observation in connection with our studies in Kansas City. These 36 individuals are characterized by the fact that when first discovered, they were sensitive to histoplasmin but not to tuberculin and that their chest roentgenograms showed the presence of otherwise undiagnosed, persistent, unhealed pulmonary lesions. Careful follow-up studies of persons showing these characteristic lesions indicate slow healing by calcification. Descriptions and illustrations of these lesions are given in an earlier publication (*4*). Although the evidence is not yet conclusive, it is believed that these cases represent mild, subclinical infections with *Histoplasma capsulatum.* As shown in table 1, 6 of the 36 individuals had positive complement fixation tests and 4 had doubtful tests. Thus the same antibodies found in 8 of the 9 proved cases have been demonstrated in 10 of these 36 suspected cases.

Miscellaneous, "control," cases.—In order to obtain information about the specificity of the complement fixation reaction and to determine the presence of complement-fixing antibodies in "control" individuals, including persons with various diseases, 242 sera were tested. Seventy of these sera were from consecutive general hospital admissions, drawn for routine Kolmer and Kahn tests. Ninety-one sera were from patients in a tuberculosis sanatorium for whom the diagnosis was proved by isolation of tubercle bacilli. An additional 81 sera were from persons referred to us for a variety of reasons. Fifty-eight individuals in this last subgroup were histoplasmin-positive, tuberculin-negative; 23 were negative to both histoplasmin and tuberculin. No positive (4-plus) complement fixation tests were found in the total group of 242 individuals. Altogether, 13 doubtful tests were observed: 7 among the 91 tuberculous patients, 6 among the 58 histoplasmin reactors, none among the 70 general hospital admissions, or the 23 histoplasmin nonreactors.

Cross-reactions with blastomycin.—Complement fixation tests were also performed on all sera using blastomycin as the antigen. As reported in the tests with guinea-pig sera (*1*), cross-reactions may also occur with human sera. However, in most cases there was less complement fixation with blastomycin than with histoplasmin. These findings will be reported later.

DISCUSSION AND SUMMARY

The present paper reports the results of complement fixation tests for histoplasmosis on 300 human sera. The specificity of the test, using histoplasmin, lot H–15, as the antigen was previously shown with guinea-pig sera: *Histoplasma*-inoculated animals showed the presence, and uninoculated animals the absence, of complement-fixing antibodies (*1*).

Fourteen positive complement fixation tests were found among the 300 human sera tested. All 14 were found in a relatively small group of 58 persons: 9 definitely proved cases of histoplasmosis, 13 persons with recently acquired skin sensitivity to histoplasmin and 36 persons with unhealed lung lesions characteristic of those associated with histoplasmin sensitivity. Seven, or 12 percent, of these 58 sera showed doubtful complement fixation tests. No positive tests were found among the remaining 242 "control" human sera; 13, or 5 percent, showed doubtful tests.

It is too early to draw definite conclusions on the interpretation of the complement fixation test and its ultimate usefulness. However, it may well be that the test will serve as an extremely important link in the chain of evidence connecting *Histoplasma* infection, sensitivity to histoplasmin, and chronic lung lesions which heal by calcification.

ACKNOWLEDGMENT

The authors desire to express their appreciation to Carroll E. Palmer, Senior Surgeon, for continued advice and encouragement.

REFERENCES

(*1*) Tenenberg, Daniel J., and Howell, Arden: A complement fixation test for histoplasmosis. I. Technic and preliminary results on animal sera. This issue, p. 163.

(*2*) Kolmer, John A., and Boerner, Fred: Approved laboratory technic, New York-London, D. Appleton Century Co. (1945).

(*3*) Prior, John A., and Allen, Margaret F.: Geographic distribution of histoplasmin and tuberculin reactors among Ohio State University freshmen and student nurses training in Columbus, Ohio hospitals. Pub. Health Rep. **62:** 1608–1615 (1947).

(*4*) Furcolow, Michael L., Mantz, Herbert L., and Lewis, Ira: The roentgenographic appearance of persistent pulmonary infiltrates associated with sensitivity to histoplasmin. Pub. Health Rep. **62:** 1711–1718 (1947).

(*5*) Howell, Arden: Studies of fungus antigens. I. Quantitative studies of cross-reactions between histoplasmin and blastomycin in guinea-pigs. Pub. Health Rep. **62:** 631–651 (1947).

(*6*) Bunnell, Ivan L., and Furcolow, Michael L.: A report on ten proved cases of histoplasmosis. Pub. Health Rep. (In Press).

THE EFFICIENCY OF METHODS FOR THE ISOLATION OF *HISTOPLASMA CAPSULATUM* [1]

By: ARDEN HOWELL, JR., PH. D., *Senior Mycologist United States Public Health Service*

INTRODUCTION

Numerous methods have been employed in attempts to isolate *Histoplasma capsulatum* from tissues (*1–7*). In order to determine a satisfactory procedure to be used, especially for materials in which the organisms are rare, the following study was undertaken.

MATERIALS AND METHODS

The strain of *Histoplasma capsulatum* used in the study was obtained from Dr. Norman F. Conant, Duke University Medical School, who reported that it was isolated in 1944 from a case of histoplasmosis in South Africa.

Seventy-nine guinea pigs were employed. Each of these was experimentally infected by the intraperitoneal injection of graded doses of a saline suspension of the yeast phase of *Histoplasma capsulatum*. The animals were then sacrificed at intervals. At autopsy, the spleen of each was removed and a portion of each cultured on each of two plates of blood agar and two of potato dextrose agar.

---

[1] From the Office of Field Studies, Tuberculosis Control Division.

The blood agar was prepared from Difco brain-heart infusion to which was added 2 percent Bacto agar and 10 percent sterile defibrinated horse blood, and will be termed B. H. I. Blood Agar or blood agar plates in this paper. The potato dextrose agar was prepared according to the method previously described (*8*). Streptomycin and penicillin, in a concentration of 40 and 20 units, respectively per ml. of medium, were added, as recommended by Thompson (*9*). After inoculation, all plates were sealed with sterile vaseline. One plate of each medium was then incubated at room temperature and the other at 37° C.

All colonies, suspected of being *Histoplasma,* were subcultured on potato dextrose agar slants which were incubated at room temperature.

RESULTS

Of the 79 guinea pigs used in this study, positive cultures were obtained from the spleens of 46. The media on which these cultures were obtained, and the temperatures at which the cultures had been maintained, are shown in table 1.

TABLE 1.—*Comparison of results of cultures on potato dextrose agar* [1] *at room temperature and on B. H. I. blood agar at room temperature and at 37° C.*

Potato dextrose agar plates at room temperature	B. H. I.—Blood Agar Plates								
	Positive at room temperature			Negative at room temperature			Total		
	Positive 37° C.	Negative 37° C.	Total	Positive 37° C.	Negative 37° C.	Total	Positive 37° C.	Negative 37° C.	Total
	Percentage								
Positive	6.5	15.2	21.7	....	19.6	19.6	6.5	34.8	41.3
Negative	2.2	52.2	54.3	4.4	....	4.4	6.5	52.2	58.7
Total	8.7	67.4	76.1	4.4	19.6	23.9	13.0	87.0	100.0
	Number of specimens								
Positive	3	7	10	0	9	9	3	16	19
Negative	1	24	25	2	0	2	3	24	27
Total	4	31	35	2	9	11	6	40	46

[1] No culture was positive on potato dextrose agar plates incubated at 37° C.

It can readily be seen, from the data presented in table 1, that B. H. I. blood agar is the more efficient medium for the isolation of *Histoplasma capsulatum,* since 37 of 46, or 80.4 percent, of the positive cultures were obtained on this medium. Furthermore, it was much more efficient than potato dextrose agar, since only 19 of 46, or 41.3 percent, of the positive cultures were obtained on the latter medium.

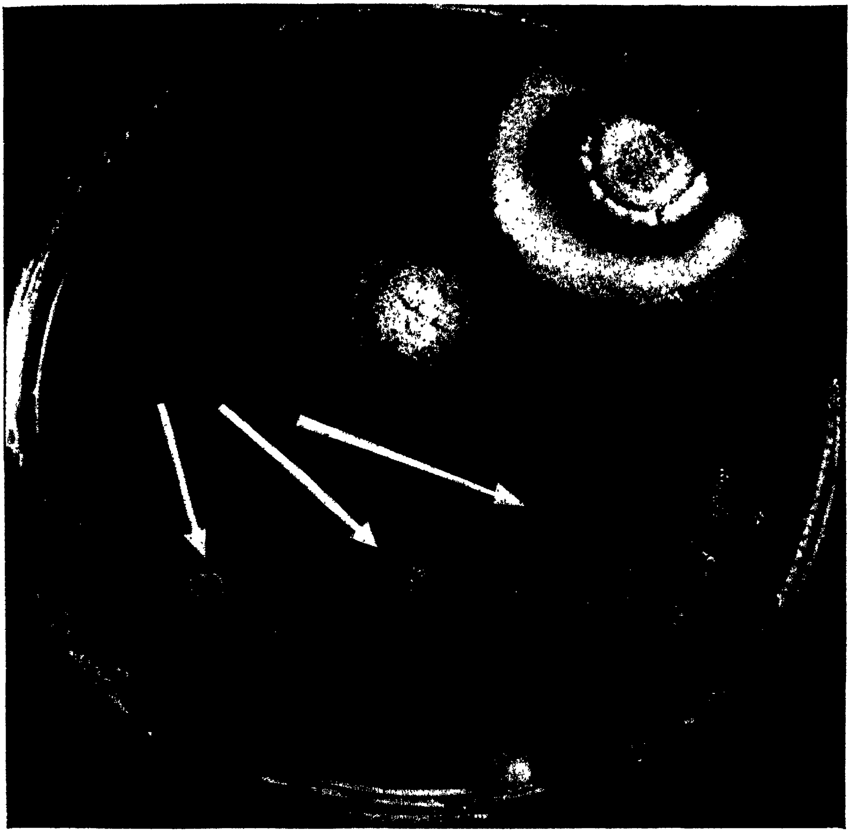


FIGURE 1.—Colonies of *Histoplasma capsulatum* on a blood agar plate incubated at room temperature.

Public Health Reports, Vol. 63, No. 6, February 6, 1948

PLATE 2

FIGURE 2.—*Histoplasma capsulatum* on a potato dextrose agar slant incubated at room temperature.

FIGURE 3.—Photomicrograph of growth from potato dextrose agar slant incubated at room temperature (864–X).

It is also evident, from the data presented in table 1, that the temperature at which the cultures were incubated was a very important factor in the isolation of *Histoplasma*. For example, while 35 of 46, or 76.1 percent, of the positive cultures were obtained on the blood agar plates incubated at room temperature, only 6 of 46, or 13.0 percent, were positive on this medium when the plates were incubated at 37° C. Similarly, while 19 of 46, or 41.3 percent, were positive on the potato dextrose agar plates incubated at room temperature, none was positive on plates of this medium incubated at 37° C.

It can also be seen, from the data presented in table 1, that 44 of 46, or 95.7 percent, of all positives were obtained by the use of the two media in plates incubated at room temperature.

While omission of any one of the procedures used, except for potato dextrose plates incubated at 37° C., would have decreased the number of positive cultures obtained, the omission of blood agar plates incubated at room temperature would have resulted in the greatest loss, as shown in table 1. For example, while the omission of the blood plates incubated at 37° C. would have decreased the number of positive cultures obtained by 2, or only 4.4 percent, and omission of potato dextrose agar plates incubated at room temperature would have decreased the total number of positives obtained by 9, or 19.6 percent, omission of the blood plates incubated at room temperature would have resulted in a loss of 24 positive cultures, or 52.2 percent of the total obtained, since this was the only procedure employed which gave a positive culture from these 24 animals. This confirms the experience of Heilman (*10*) who reported that he obtained the best results in the isolation of *Histoplasma capsulatum* from human cases by the use of blood agar plates incubated at approximately 30° C.

In addition to the higher efficiency of the blood agar, incubated at room temperature, for the isolation of *Histoplasma capsulatum*, it should be pointed out that colonies of this fungus, when grown under these conditions, are usually atypical in appearance. As described by De Monbreun (*1*), and as shown in figure 1 the colonies are usually moist, heaped, and somewhat cerebriform in appearance, varying in color from cream-colored to deep pink to reddish-brown. The growth from these colonies is usually devoid of spore forms, being composed entirely of mycelium. When subcultured on potato dextrose agar, and incubated at room temperature, however, they develop into the typical white, later cinnamon-brown, cottony type of growth, with abundant aerial mycelium (fig. 2) on which are produced abundant small and large chlamydospores with numerous large tuberculate chlamydospores characteristic of *Histoplasma capsulatum* (fig. 3) (*1, 11*).

SUMMARY AND CONCLUSIONS

Positive cultures were obtained from the spleens of 46 guinea pigs experimentally infected with *Histoplasma capsulatum.* The media employed for isolation were brain-heart infusion blood agar and potato dextrose agar, with plates of each medium incubated at both room temperature and at 37° C. It was shown that:

1. Cultures on B. H. I. blood agar, incubated at room temperature, were the most efficient for the isolation of *Histoplasma capsulatum.*
2. Colonies of this fungus which develop on B. H. I. blood agar, incubated at room temperature, are moist, heaped, and cerebriform in appearance, and may develop a pink to reddish-brown pigmentation. Such colonies must be transferred to a medium such as potato dextrose agar, and incubated at room temperature, in order to obtain the characteristic tuberculate chlamydospores which allow positive identification.

REFERENCES

(*1*) DeMonbreun, W. A.: The cultivation and cultural characteristics of Darling's *Histoplasma capsulatum.* Am. J. Trop. Med. **14:** 93–126 (1934).

(*2*) Hansmann, G. H. & Schenken, J. R.: A unique infection in man caused by 'a new yeast-like organism, a pathogenic member of the genus *Sepedonium.* Am. J. Path. **10:** 731–738 (1934).

(*3*) Reid, J. D., Scherer, J. H., Herbut, P. A., & Irving, H.: Systemic histoplasmosis. J. Lab. & Clin. Med. **27:** 419–434 (1942).

(*4*) Van Pernis, P. A., Benson, M. E. & Hollinger, P. H.: Specific cutaneous reactions with histoplasmosis. J. A. M. A. **117:** 436–437 (1941).

(*5*) Parsons, R. J. & Zarafonetis, C. J. D.: Histoplasmosis in man. Report of 7 cases and a review of 71 cases. Arch. Int. Med. **75:** 1–23 (1945).

(*6*) Iams, A. M., Tenen, M. M. & Flanagan, H. F.: Histoplasmosis in children. Review of the literature, with report of a case. Am. J. Dis. Child. **70:** 229–240 (1945).

(*7*) Iams, A. M. & Keith, H. M.: Histoplasmosis in infancy. J. Ped. **30:** 123–128 (1947).

(*8*) Howell, A., Jr.: Studies in *Histoplasma capsulatum* and similar form species. I. Morphology and development. Mycologia **31:** 191–216 (1939).

(*9*) Thompson, L.: Note on a selective medium for fungi. Proc. Mayo Clinic **20:** 248–249 (1945).

(*10*) Heilman, F. R. Personal communication to the author.

(*11*) Conant, N. F.: A cultural study of the life-cycle of *Histoplasma capsulatum.* J. Bact. **41:** 563–579 (1941).

STUDIES OF FUNGUS ANTIGENS

II. Preliminary Report on the Isolation of an Immunologically Active Polysaccharide from Histoplasmin[1]

By: FORREST W. CROSS, *Assistant Sanitarian (R) and* ARDEN HOWELL, JR., PH. D., *Senior Mycologist, United States Public Health Service.*

INTRODUCTION

It has been shown (*1, 2*) that guinea pigs experimentally infected with either *Histoplasma capsulatum* or *Blastomyces dermatitidis* will react to histoplasmin. It was felt, therefore, that if the reacting principle could be isolated from histoplasmin it might be more specific and could be more accurately standardized. Accordingly, carbohydrates and protein fractions were extracted from histoplasmin by accepted chemical procedures. The following is a preliminary report of an immunologically active polysaccharide isolated from histoplasmin.

MATERIALS AND METHODS

Several strains of both *Histoplasma capsulatum* and *Blastomyces dermatitidis* were used in these studies. Two lots of histoplasmin and one of blastomycin, designated as lots H-15, H-17, and B-7, respectively, were employed. These were prepared by a method similar to that used by Emmons et al. (*1*) as previously reported (*2*).

A polysaccharide fraction of histoplasmin was prepared from lot H-17 by a method suggested by Martin (*3*). In this technic, the proteins were removed by precipitation with glacial acetic acid. After addition of the acid the mixture was allowed to stand in the refrigerator overnight (5° C), and the precipitated proteins then removed by filtration through nitrogen-free filter paper and centrifugation.

After removal of the proteins, the polysaccharide was precipitated by the addition of four volumes of ethyl alcohol (95 percent) and the mixture was allowed to stand for 24 hours at 5° C. The precipitate was removed by centrifugation, and then dissolved in ten percent sodium acetate. After acidifying with acetic acid, and centrifugation to remove any free protein remaining, the polysaccharide was again precipitated with cold ethyl alcohol and allowed to stand at 5° C for 2 hours. This purification was repeated, and the resulting precipitate, removed by centrifugation, dissolved in distilled water. After a final precipitation with cold alcohol, the resulting precipitate was again removed by centrifugation and dried in vacuo over NaOH. The yield of polysaccharide was 0.2051 grams from 600 ml. of stock H-17 histoplasmin, or equal to 0.34 mg. per ml.

Testing solutions of the polysaccharide were prepared by dissolving the dried powder in sterile distilled water to make a final contentration of 10 mg./ml., with subsequent sterilization by filtration through a Seitz filter.

---

[1] From the Office of Field Studies, Tuberculosis Control Division.

Examination of this solution for the presence of free protein, using trichloracetic acid, Millon's reagent, ammonium sulfate and xanthoproteic and biuret reactions indicated that no free proteins were present. This solution contained 0.464 mg./ml. nitrogen. Preliminary tests for reducing sugars using Benedict's reagent and the Shaffer-Hartman and Somogyi methods (*4*, *5*) indicated that such sugars were absent. However, when a small sample was hydrolysed with normal hydrochloric acid and subsequently neutralized and tested with copper sulfate (*4*), reducing sugars were found to be present.

As a control for the skin test studies, a small amount of the stock solution of lot H-17 histoplasmin was dried in vacuo over NaOH, and the residue diluted with distilled water to make a final concentration of 10 mg. per ml. The yield of total solid was 1.2799 grams from 40 ml. of stock H-17, or equal to 32 mg. per ml.

Each of 25 albino guinea pigs were tested by the intradermal injection of a skin test dose (0.1 cc.) of a 1-100 dilution of lot H-15 histoplasmin and 1 mg. per ml. of the polysaccharide fraction of lot H-17. Fifteen of these normal animals were also tested with the same concentration of lot H-17 (1 mg./ml.). None of these normal animals reacted to either antigen in this dilution. Thirty-four additional normal albino guinea pigs were then tested similarly with lot H-15. Since none of these normal animals reacted to this dilution, they were inoculated by the intraperitoneal injection of a saline suspension of the yeast phase of *H. capsulatum*. Five to seven weeks after inoculation, each of the guinea pigs was tested with several dilutions of lots H-15 and H-17 histoplasmin and the polysaccharide fraction prepared from lot H-17. Reactions of guinea pigs to the polysaccharide fraction, as previously reported for histoplasmin (*1*, *2*) reach their height at 24 hours, and may disappear within 48 hours. Only those tests which showed 5 mm. or more of induration were considered reactors.

1. Titration of polysaccharide fraction of histoplasmin.—The results of testing guinea pigs experimentally inoculated with *Histoplasma capsulatum* with the polysaccharide isolated from lot H-17 histoplasmin are shown in table 1.

It is evident, from the data presented in table 1 that guinea pigs experimentally inoculated with *H. capsulatum* will react to the polysaccharide fraction of histoplasmin.

It is also evident, from the data presented in table 1, that, as previously shown for various lots of histoplasmin (*2*) the percentage of experimentally inoculated animals which will react to the polysaccharide fraction of histoplasmin, and the size of the reaction, is dependent upon the dosage employed. For example, while 31 of

33, or 93.9 percent, reacted to a dosage of 0.1 mg., 26 of 33, or 78.8 percent, reacted to 0.01 mg., and 15 of 33, or 45.5 percent, to 0.001 mg.

TABLE 1.—*Results of testing with various dilutions of lots H–15 and H–17 histoplasmin and the polysaccharide fraction of lot H–17 in guinea pigs experimentally inoculated with* Histoplasma capsulatum

Item	Histoplasmin				Polysaccharide fraction of histoplasmin		
	Lot H-15 dilution		Lot H-17 dilution of 1 ml. containing—		Lot H-17 dilution of 1 ml. containing—		
	1-100	1-1000	1.0 mg. solid	0.1 mg. solid	1.0 mg.	0.1 mg.	0.01 mg.
Number of animals tested	34	33	33	33	33	33	33
Number of reactors	29	22	27	21	31	26	15
Percentage of reactors	85.3	66.7	81.8	63.6	93.9	78.8	45.5
Average diameter of reaction[1]	12.5	7.2	8.6	6.9	13.3	9.1	6.2

[1] Induration in millimeters.

Therefore, as for histoplasmin (*2*), it would seem to be very important to determine the critical *titer* or *dosage* of any fraction of histoplasmin to be employed to determine sensitization of an individual by *Histoplasma.*

It has been suggested (*2*) that for practical purposes the critical *titer* or *dosage* of any antigen to be used as a skin testing antigen be the *minimal* amount of that antigen which would detect sensitivity in approximately 80–90 percent of such a group of animals. On this basis, it would seem, from the data presented in table 1, that 0.1 to 0.01 mg. would be for practical use, the *critical dosage* of the polysaccharide fraction of histoplasmin. However, from a comparison of the data presented in table 1 and data previously presented (*2*) it is evident that this group of animals (table 1) were not at the height of their sensitivity level at the time they were tested since a dilution of lot H–15 histoplasmin gave a reaction in only 22 of 33, or 66.7 percent of the animals sensitized with *Histoplasma,* whereas it has previously been shown (*2*) that this dilution of lot H–15 should detect 85 to 90 percent of such a group of animals. From this comparison, therefore, it would seem that for practical use the critical *titer* of the polysaccharide fraction of histoplasmin would probably be a dosage of between 0.01 and 0.001 mg., even though in the group of animals reported in table 1 these dosages gave reactions in only 78.8 and 45.5 percent of the animals tested.

2. Cross-reactions of the polysaccharide fraction of histoplasmin.—In addition to the studies reported above in which the polysaccharide fraction of histoplasmin was tested on guinea pigs experimentally inoculated with *Histoplasma capsulatum,* this fraction was also tested on guinea pigs experimentally inoculated with *Blastomyces dermatitidis*, using lot B–7 blastomycin as a control. The results of these tests are summarized in table 2.

TABLE 2.—*Results of testing with various dilutions of lot B–7 blastomycin and the polysaccharide fraction of lot H–17 histoplasmin in guinea pigs experimentally inoculated with* Blastomyces dermatitidis

Item	Blastomycin—Lot B–7 dilution		Polysaccharide fraction of histoplasmin—Lot H–17 dilution of 1 ml. containing—		
	1–100	1–1000	1.0 mg.	0.1 mg.	0.01 mg.
Number of animals tested	28	24	27	27	27
Number of reactors	27	12	13	7	1
Percentage of reactors	96.4	50.0	48.1	25.9	3.7
Average diameter of reactions [1]	10.7	6.1	7.7	5.9	6.0

[1] Induration in millimeters.

It can be seen, from the data presented in table 2, that guinea pigs experimentally inoculated with *B. dermatitidis* will react to the polysaccharide fraction of histoplasmin. As previously noted for histoplasmin (*2*), however, and for animals inoculated with *Histoplasma* (table 1), the number of animals which react, and the size of the reaction, is dependent upon the dosage employed (table 2).

As was noted above for the animals sensitized with *Histoplasma* (table 1), the animals reported in table 2 were also apparently not at the peak of their sensitivity level; as has been shown previously (*2*), at the peak of sensitivity a 1–1000 dilution of lot B–7 blastomycin should give reactions in at least 85 to 90 percent of animals sensitized by *B. dermatitidis*. It is possible, therefore, that had they been at the peak, the number which reacted to the polysaccharide fraction of histoplasmin might have been higher than the numbers shown in table 2. However, it would seem unlikely, in view of the percentage of reactors obtained, that this percentage of cross-reactions would be very high if the critical *titer* of the polysaccharide fraction is employed as a skin test antigen.

DISCUSSION

It has been shown above (table 1) that almost all guinea pigs experimentally inoculated with *Histoplasma capsulatum* will react to the polysaccharide fraction isolated from histoplasmin. It has also been shown (table 1) that the number and percentage of such animals which reacted to this fraction were equal to, or greater than, the number and percentage which reacted to the same concentration of the residue from the stock solution of the same lot of histoplasmin. For example, 26 of 33, or 78.8 percent, reacted to 0.01 mg. of the polysaccharide while only 21 of 33, or 63.6 percent, reacted to the same dosage of the residue of the stock solution (table 1).

The polysaccharide yield was only one percent of the total solids in H-17. However, since the percentage of the total solid in stock H-17 which is immunologically active is unknown, the percentage yield of the reacting principle cannot be determined. Therefore, although it is not possible to state that none of the active principle was lost during the process of purification, it would seem that at least some of the active principle of histoplasmin is polysaccharide in nature.

Further studies on the activity and specificity of both polysaccharide and protein fractions of histoplasmin are in progress.

SUMMARY

A polysaccharide fraction shown to be free from protein by a variety of qualitative tests has been isolated from one lot of histoplasmin. This antigen has been tested on guinea pigs experimentally inoculated with *Histoplasma capsulatum* and *Blastomyces dermatitidis*, using histoplasmin and blastomycin, respectively, as controls.

It has been demonstrated that:

1. This polysaccharide fraction of histoplasmin will give reactions in guinea pigs experimentally inoculated with either *Histoplasma capsulatum* or *Blastomyces dermatitidis*.

2. The number of animals inoculated with either fungus which will react to this antigen is dependent upon the dosage employed.

3. It is suggested that the active principle of histoplasmin is, at least in part, polysaccharide in nature, and that if the critical *titer* of this antigen is determined, it will be found to be relatively specific for animals infected with *Histoplasma capsulatum*.

ACKNOWLEDGMENT

The authors wish to express their appreciation to Dr. Hans Neurath, Professor of Biophysical Chemistry, Duke University, for the determination of the nitrogen value and for his criticism of the manuscript.

REFERENCES

(*1*) Emmons, C. W., Olson, B. J. and Eldridge, W. W.: Studies on the role of fungi in pulmonary disease. I. Cross-reactions of histoplasmin. Pub. Health Rep. **60**: 1383–1394 (1945).

(*2*) Howell, A. Jr.: Studies of fungus antigens. I. Quantitative studies of cross-reactions between histoplasmin and blastomycin in guinea pigs. Pub. Health Rep. **62**: 631–651 (1947).

(*3*) Martin, D. S.: Personal communication to the author.

(*4*) Shaffer, P. A. and Hartmann, A. F.: The iodometric determination of copper and its use in sugar analysis. II. Methods for the determination of reducing sugars in blood, urine, milk, and other solutions. J. Biol. Chem. **45**: 365–390 (1921).

(*5*) Somogyi, M.: Notes on sugar determination. J. Biol. Chem. **70**: 599–612 (1926).

ON THE VERIFICATION OF THE DIAGNOSIS OF TUBERCULOSIS

By: C. EUGENE WOODRUFF, M. D.[1]

The various campaigns now in progress for the early diagnosis of tuberculosis through X-ray surveys have brought about a gradual change in the type of case admitted for sanatorium care. Ten or fifteen years ago, a patient usually consulted his physician because of symptoms, and may have been referred to the sanatorium following an X-ray. At present, the sequence of diagnostic procedures is likely to be reversed: an increasingly large proportion of patients is admitted to tuberculosis sanatoria because of X-ray findings alone. Under such conditions, there will be, necessarily, an increased proportion of of patients who, after exhaustive study, are found not to have pulmonary tuberculosis at all, for the expert roentgenologist will be the first to admit that the diagnosis of tuberculosis from the X-ray alone is by no means infallible (*1*). So, increasingly, the clinical staff of the sanatorium is forced to fall back on the laboratory for some definite confirmation of the roentgenographic diagnosis.

The importance of obtaining laboratory evidence as quickly as possible to decide whether the afflicted person actually has tuberculosis may be emphasized from two points of view; that of the patient, and that of the public health program. From the point of view of the patient, the diagnosis of tuberculosis carries with it a certain amount of mental shock. Obviously this should not be inflicted on any person unnecessarily, nor should the patient who does not have tuberculosis be exposed to the hazard of tuberculosis contact in the wards of a sanatorium. From the point of view of the public health program, the entire early diagnosis campaign will be discredited unless a swift and accurate diagnosis of each patient's condition is made (*2*). From the same point of view, the very limited sanatorium facilities for the tuberculous should not be tied up unnecessarily by patients who do not actually require sanatorium care (*3*).

METHOD

As a partial answer to the need for rapid laboratory confirmation or negation of the X-ray diagnosis of tuberculosis, some sanatoria have again brought into active use a long-neglected procedure—the routine tuberculin testing of patients. At the Wm. H. Maybury Sanatorium, a tuberculin test is given to every newly admitted adult patient. One-tenth ml. of a 1:10,000 dilution of Old Tuberculin (0.01 mg.)[2] is injected intracutaneously by the medical technologist at the same time that blood is taken for the admission blood count. Reactions are read at the end of 48 hours, and an area of induration or edema of 5 mm. or more in diameter is considered a positive reaction. Patients who are nonreactors to the first dilution are retested at 48-hour intervals with tuberculin ten times as concentrated, and with successively stronger dilutions until the final dilution 1:10 OT (10 mg.) is reached.

---

[1] From the Wm. H. Maybury Sanatorium (Detroit Municipal Tuberculosis Sanatorium) Northville, Michigan.

[2] All of the tuberculin used in this study was kindly furnished by Parke, Davis and Company of Detroit.

Testing with the successively more concentrated tuberculin makes it possible to assign each patient to a "sensitivity level" or "sensitivity group," depending upon the dilution of tuberculin to which he reacts (*4*). Thus, all patients who show the usual reaction to the 1:10,000 dilution of tuberculin are included in the "10,000" sensitivity group. Those patients who fail to react to 1:10,000 OT, but who show a positive reaction to 1:1,000 OT, are assigned to the "1,000" group, and a similar procedure is followed for the other dilutions. Patients who fail to react to 1:10 OT are described in the present study as *anergic* and are placed in the "0" sensitivity group.

An additional sensitivity group, the "100,000" group, has been created for those patients who show the most marked hypersensitivity to tuberculin. Patients with a reaction to 1:10,000 OT averaging 35 mm. or more in diameter are retested with the 1:100,000 dilution. In nearly every instance, they have been found to give a positive reaction to this very minute quantity of tuberculin and have been placed in the "100,000" sensitivity group.

In addition to the tuberculin and other routine tests, every effort is made to demonstrate tubercle bacilli in the sputum of the patient. If stained smears fail to reveal acid-fast bacilli, repeated sputum cultures are made, to be followed in some instances by cultures of the gastric contents.

SENSITIVITY GROUPS

During the 2-year period, January 1, 1945 to January 1, 1947, 1,376 patients, newly admitted to the Wm. H. Maybury Sanatorium, were adequately studied with regard to both sputum and tuberculin test.[3] These individuals varied in age from 13 to 83 years, were of both sexes, and included approximately 15 percent colored patients. In every case a tentative diagnosis of tuberculosis had been made, by X-ray or other means, before the patient was admitted to Maybury. Table 1 gives the classification of the patients according to tuberculin sensitivity and sputum findings.

---

[3] During these 2 years, 1,715 patients were admitted to the Sanatorium. Of these, 297 were admitted to the children's unit and are excluded from the present study for that reason. Thirteen adults are excluded either because they left the Sanatorium against advice or were discharged before their series of tuberculin tests had been completed. Twenty-nine adults are excluded because death occurred before their tuberculin tests had been completed. Twenty-eight of these latter were proved tuberculous by either sputum findings or postmortem examination. The one nontuberculous death was due to carcinoma of the lungs.

It will be seen from table 1 that in more than 50 percent of the cases, the sputum was found to contain tubercle bacilli following the examination of direct or concentrated smears. This information was available 4 days after the patient's admission to the sanatorium. In another 22.9 percent of the cases, the clinician had to wait 3 to 8 weeks, or longer, for a report from cultures of the sputum of gastric contents. More important still, in 25.6 percent of the cases, direct bacteriologic proof of infection with tubercle bacilli was not found. In contrast to the bacteriologic findings, the totals for the sensitivity groups indicate that the great majority of the patients fall in the first three groups. The total for these 3 groups is 1,302, or 94.7 percent of the grand total of 1,376 patients; the results from these first 2 tuberculin tests, also, were available to the clinician on the fourth day after the admission of the patient.

TABLE 1.—*Classification of 1,376 patients according to tuberculin sensitivity and sputum findings*

Tuberculin sensitivity level [1] group	Total		Sputum findings in patients					
			Smear positive		Smear negative [3] culture positive		Smear and culture negative	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	1,376	100.0	708	51.5	315	22.9	353	25.6
100,000	53	100.0	15	28.2	13	24.6	25	47.2
10,000	1,072	100.0	550	51.3	270	25.2	252	23.5
1,000	177	100.0	111	62.7	26	14.7	40	22.6
100	24	100.0	16	66.7	3	12.5	5	20.8
10	14	100.0	7	50.0	1	7.1	6	42.9
0	36	100.0	[2] 9	25.0	2	5.6	25	69.4

[1] Patients are tested with varying doses of OT; assignment to group 100,000, 10,000, 1,000, 100, or 10 indicates reaction to the specified strength of OT, while group 0 designates anergic patients failing to react to the dosage 1:10 OT.

[2] The number of cases in this particular group would have been materially increased had it been possible to include the 28 tuberculous patients who died before their tuberculin tests had been completed. See footnote 3, on page 185.

[3] The column "Smear negative-culture positive" includes 14 cases recorded as positive because of the culture of gastric contents, the presence of tubercle bacilli in the stomach being the result, presumably, of swallowed sputum.

While a high level of sensitivity to tuberculin is not a response upon which to base a clinical diagnosis of tuberculosis, experts in the field agree that skin sensitivity to the 1:1000 dilution of tuberculin, or to lesser amounts, at least indicates that the patient at some previous time has been infected with tubercle bacilli. Thus, on the fourth day after the patient's admission, the tuberculin test gave presumptive evidence of tuberculous infection in 94.7 percent of the patients while examination of the sputum, after 4 days, yielded positive results in only 51.5 percent of the cases.

A brief scanning of table 1 reveals a considerable variation in sensitivity among the relative number of patients who were found positive on smear, positive on culture alone, or who were negative following both smear and culture examinations. These variations are shown diagramatically in figure 1. It will be seen that the proportion of patients for whom tubercle bacilli are shown in smears of the sputum increases with the decrease in sentitivity until a maximum of 66.7 percent is reached at the "100" sensitivity level. On the other hand, the proportion of patients for whom both smear and culture examinations were negative, changes in practically inverse ratio; the maximum for this group is found at the "0" sensitivity level. The explanation for these changes is to be found in the fact that the anergic or partially anergic patients fall into two well defined clinical groups: those who are critically ill with tuberculosis and who are anergic for that reason, and those who do not have tuberculosis at all (*5*). For patients who are anergic because of their extensive disease, tubercle bacilli will be demonstrated in direct smears of the sputum in nearly every case; (*5*, *6*), while in the nontuberculous patients it is impossible to demonstrate tubercle bacilli no matter how many cultures of the sputum or gastric contents are made.

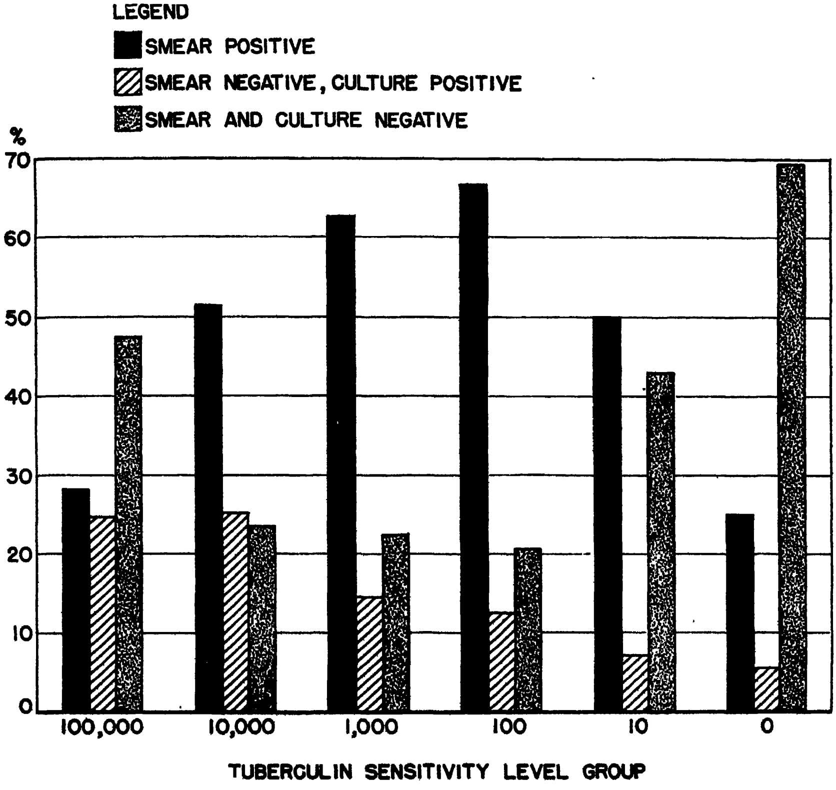


Figure 1.—Tuberculin sensitivity as related to sputum findings in newly admitted sanatorium patients.

As mentioned above, the patient with active tuberculosis who is anergic is always critically ill. In our experience these cases have always had a fatal outcome within 6 weeks of their admission to the sanatorium. On the other hand, the nontuberculous anergic patients usually have no symptoms at all, in spite of X-ray pictures which may look alarming. Most of these patients are discharged from the sanatorium with the diagnosis of sarcoid disease, bronchiectasis, atypical pneumonia, tracheobronchial lymphadenitis, or one of the fungus infections.

DISCUSSION

The nationwide campaigns now being fostered for the early diagnosis of tuberculosis are having two effects: the desirable one of causing the discovery of more cases of minimal tuberculosis, and the undersirable one of causing occasional patients who do not have tuberculosis to be sent to tuberculosis sanatoria. The dangers of this latter development to both the patient and the public health program have been pointed out, as well as the necessity for determining as soon as possible, in the case of each newly-admitted patient, whether he should remain in the sanatorium environment.

Routine tuberculin tests, started on the day a patient is admitted to the sanatorium, can be of considerable aid in determining whether the patient actually has tuberculosis. Such tests will, on the fourth day after admission, give presumptive evidence of tuberculous infection in approximately 95 percent of new admissions; the examination of sputum smears for tubercle bacilli will yield positive results in only a little over 50 percent of the same patients.

It is evident that the 95 percent of newly admitted patients who react to 0.1 mg or less of tuberculin will include an occasional patient whose major pulmonary disease is something other than tuberculosis—carcinoma or fungus infection for example (*7*, *8*, *9*). However, the evidence of a previous infection with tubercle bacilli given by this level of tuberculin sensitivity justifies keeping the patient in the sanatorium for a more leisurely determination of the diagnostic problem involved.

In the approximately 5 percent of patients who *fail* to react to the 1:1000 dilution of tuberculin it is important to continue the tests to determine as accurately as possible, the level of tuberculin sensitivity of each patient. The present study indicates that with the decrease in sensitivity to tuberculin there is an increasing tendency for the patients to fall into two groups: those who are critically ill with tuberculosis and who are likely to show tubercle bacilli in direct or concentrated sputum smears, and those in relatively good condition who do not have tuberculosis at all. Determining to which of these two groups the anergic patient belongs is of the greatest importance, for in one case he is definitely in need of isolation in an institution for the tuberculous, and in the other, he should be removed from such an institution as quickly as possible.

With the additional help of a good history and physical examination, differentiation between the tuberculous and the nontuberculous anergic patient is usually simple; in most cases it can be done merely by determining whether or not the patient is acutely ill. Anergic patients in good physical condition, whose initial studies fail to show tubercle bacilli in smears of the sputum, should be discharged without waiting for the results of sputum cultures, for in our experience such cultures have been either completely negative or have yielded only acid-fast saprophytes. Three times during the past 4 years the laboratory has reported sputum cultures positive for tubercle bacilli in anergic patients who were not clinically ill. In each instance, because the patient was anergic the culture was inoculated immediately into a guinea pig. Every one of the cultures failed to produce tuberculosis in the animal. In each instance these cultures had been "read" by individuals with long experience in tuberculosis laboratory work. (Smears of the cultures had not been made.) Thus, in these cases the quantitative tuberculin test served as an effective check on the most definitive report given by the laboratory—that regarding the presence or absence of tubercle bacilli in the sputum (*5*). It should be reemphasized that virulent tubercle bacilli are not found in the sputum of an anergic patient unless he is critically ill.

SUMMARY

Of 1,376 patients admitted to a sanatorium because of roentgenographic or other findings suggestive of tuberculosis, 51.5 percent revealed tubercle bacilli in direct or concentrated smears of the sputum; 94.7 percent were found to react to 1:1000 OT or to less concentrated dilutions.

The advantages of determining accurately the level of tuberculin sensitivity of each newly admitted patient are indicated.

By combining an accurate sputum study and determination of tuberculin sensitivity with an estimation of the condition of the patient, the clinician is better able to assess the roentgenographic findings in suspected cases of tuberculosis.

REFERENCES

(*1*) Myers, J. A.: The establishment and use of fundamental procedures in tuberculosis control. Pub. Health Rep., **61**: 1563–1583 (1946).
(*2*) Hilleboe, H. E.: Editorial—What is early tuberculosis? Ibid., **61**: 1295–1297 (1946).
(*3*) Editorial—Need for hospital facilities for the tuberculous. Ibid., **61**: 1131–1132 (1946).
(*4*) Woodruff, C. E.: Tuberculin allergy in patients critically ill with tuberculosis. Am. Rev. Tuberc., **53**: 583–588 (1946).
(*5*) Woodruff, C. E.: The quantitative tuberculin test—Its significance in the diagnosis of tuberculosis. Ibid., **55**: 488–494 (1947).
(*6*) Brosius, W. L., and Woodruff, C. E.: The effect of sensitivity on the distribution of tubercle bacilli in tuberculosis. Ibid., **50**: 473–480 (1944).
(*7*) Gerstl, B., Warring, F. C., and Howlett, K. S.: Cancer and pulmonary tuberculosis. Ibid., **54**: 470–488 (1946).
(*8*) Parsons, R. J., and Zarafonetis, C. J. D.: Histoplasmosis in man. Arch. Int., Med., **75**: 1–23 (1945).
(*9*) Davis, B. L., Smith, Ruth T., and Smith, C. E.: An epidemic of coccidiodal infection (coccidioidomycosis). J. A. M. A., **118**: 1182–1184 (1942).

MECHANISM OF IMMUNITY AND ALLERGY IN TUBERCULOSIS [1] [2]

By *Professor* J. K. WEISSFEILER

Conclusions

1. Natural resistance to TB varies between widely separated extremes in man as well as in animals, determining the course followed by tuberculosis infection.
2. Tuberculosis infection is accompanied by heightened resistance to subsequent contagion. Acquired immunity to tuberculosis does not fit into the framework of typical immunity to infection, but differs from it in several peculiarities.
3. Like natural immunity, acquired immunity is characterized by lung stability in the organism and cessation of multiplication of tubercle bacilli. Parallel with this, there are the processes of destruction, elimination, and calcification.
4. Tuberculosis infection is accompanied by an increased sensitivity to the various components of the tubercle bacillus (specific allergy), as well as to nonspecific antigens (hetero-allergy).
5. Tuberculosis allergy does not represent an anaphylactic phenomenon but rather a phenomenon of intoxication. The central nervous system is especially sensitive to products of the tubercle bacillus.
6. Tuberculosis immunity and allergy do not appear identically, nor do they invariably follow a parallel course of development. They may reveal themselves simultaneously in the organism, but they are easily dissociated experimentally.
7. The dynamics of the development of allergy and immunity and their relations differ in the various types of tuberculous illness. It is possible to establish some regularities in the development of tuberculous processes in connection with immuno-biological modifications.
8. The study of the mechanism of immuno-biological factors in tuberculosis will make it possible to influence them for therapeutic and prophylactic purposes.

---

[1] Published in "Problemy Tuberkuleza, 1946, No. 2: 3-14. Ministry of Public Health, Moscow, U. S. S. R

[2] Translated from Russian by the Office of the Chief, Tuberculosis Control Division, U. S. Public Health Service.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JANUARY 17, 1948

Summary

The number of reported cases of influenza increased slightly during the week—from 10,335 cases last week to 10,360 for the current week. More than 90 percent of the cases were reported in 8 States in the southern and southwestern areas, which were the only States reporting more than 200 cases. These States are as follows (last week's figures in parentheses): Texas 4,509 (4,712), Arizona 1,039 (849), California 1,023 (1,272) South Carolina 880 (916), Virginia 868 (849), Oklahoma 442 (124), Arkansas 439 (452) and Alabama 265 (277).

The outbreaks in which the clinical symptoms have been reported have presented a varied clinical picture in which gastro-intestinal symptoms have predominated and including sore throat and various other upper-respiratory infections. The disease has apparently been reported generally as mild, with sudden onset, of short duration, and relatively low temperatures. The great variation in symptoms indicates that epidemic nausea, vomiting and diarrhea and the common cold are also present in some of the reported outbreaks.

The incidence of poliomyelitis has dropped to about the normal seasonal level—40 cases were reported currently, as compared with 41 for the preceding week, 91 for the corresponding week in 1947 and a 5-year (1943–47) median of 46 for the week.

One case of smallpox each was reported in Missouri, Idaho, Colorado and Arizona, and 1 case of anthrax each in Massachusetts and Pennsylvania. Diphtheria, meningococcus meningitis, scarlet fever and typhoid fever are below previous low figures, while the incidence of measles is above that for any prior year since 1944 and whooping cough higher than for any other year since 1943.

During the current week 10,150 deaths, all causes, were reported in 93 large cities in the United States, as compared with 11,313 for the preceding week, 9,960 for the corresponding week of 1947, and 10,401 for the same week in 1946. The cumulative total for the first 3 weeks this year is 31,881, as compared with 30,807 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Jan. 17, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47
	Jan. 17, 1948	Jan. 11, 1947		Jan. 17, 1948	Jan. 11, 1947		Jan. 17, 1948	Jan. 11, 1947		Jan. 17, 1948	Jan. 11, 1947	
NEW ENGLAND												
Maine	1	6	4	------	------	------	1	292	16	0	1	1
New Hampshire	0	0	0	------	------	------	1	22	12	0	0	0
Vermont	0	1	0	------	------	------	19	117	8	0	1	0
Massachusetts	1	19	4	------	------	------	226	443	358	3	1	8
Rhode Island	0	2	2	------	1	9	------	25	9	0	0	0
Connecticut	0	0	1	------	1	4	9	124	61	1	3	4
MIDDLE ATLANTIC												
New York	17	36	16	[1] 3	[1] 17	[1] 22	460	246	852	9	9	25
New Jersey	3	5	5	8	6	26	747	76	76	4	4	11
Pennsylvania	8	13	16	(2)	[2] 3	[2] 5	348	1,221	776	5	4	16
EAST NORTH CENTRAL												
Ohio	5	17	15	6	8	14	648	286	61	0	1	14
Indiana	6	10	11	23	19	19	203	11	46	0	3	3
Illinois	0	4	5	2	2	11	1,114	17	176	3	6	9
Michigan [3]	4	13	7	2	4	5	837	23	135	1	0	9
Wisconsin	0	0	1	51	20	147	217	147	147	1	3	4
WEST NORTH CENTRAL												
Minnesota	0	12	6	------	------	2	320	12	12	0	0	2
Iowa	1	1	6	------	------	------	111	31	31	0	2	1
Missouri	4	6	5	6	9	10	40	5	43	3	6	6
North Dakota	0	1	1	13	37	46	28	2	5	1	0	0
South Dakota	0	5	2	------	------	------	11	2	19	0	1	1
Nebraska	0	1	6	16	25	31	11	4	20	0	0	1
Kansas	5	1	4	3	86	86	10	4	65	2	2	4
SOUTH ATLANTIC												
Delaware	1	0	0	------	------	------	13	1	2	0	0	0
Maryland [3]	22	14	12	6	5	22	23	33	22	1	2	7
District of Columbia	0	0	0	1	3	3	49	19	13	2	0	1
Virginia	8	14	11	868	504	504	50	145	145	2	8	10
West Virginia	2	2	5	159	98	98	230	------	15	3	1	1
North Carolina	21	10	15	------	------	------	1	155	36	3	1	3
South Carolina	5	9	6	880	774	854	7	70	70	1	3	3
Georgia	5	3	9	77	14	157	25	60	21	1	0	2
Florida	2	5	5	9	18	4	32	9	17	0	6	6
EAST SOUTH CENTRAL												
Kentucky	4	11	8	------	2	47	30	2	152	4	6	6
Tennessee	6	13	9	110	31	63	40	4	68	3	2	6
Alabama	11	4	5	265	51	265	14	21	19	2	1	7
Mississippi [3]	5	6	9	15	------	------	37	------	------	0	3	5
WEST SOUTH CENTRAL												
Arkansas	2	8	9	439	144	158	44	29	29	1	0	3
Louisiana	10	8	8	180	26	26	14	1	22	5	4	4
Oklahoma	7	2	8	442	97	189	16	8	14	2	1	2
Texas	19	32	35	4,509	2,397	2,397	640	59	87	8	1	14
MOUNTAIN												
Montana	3	2	1	19	21	21	81	188	26	0	0	1
Idaho	1	0	0	52	23	2	2	6	12	0	0	0
Wyoming	0	1	0	------	12	28	11	1	8	2	0	0
Colorado	6	6	7	69	50	50	25	14	78	0	1	2
New Mexico	1	3	2	1	4	4	4	41	2	1	1	1
Arizona	5	2	2	1,039	181	181	4	77	7	0	1	1
Utah [3]	4	0	0	2	12	12	7	2	21	0	0	1
Nevada	0	0	0	------	------	------	1	------	3	1	1	1
PACIFIC												
Washington	0	5	5	12	------	------	111	32	102	1	1	9
Oregon	1	4	4	50	16	27	24	42	58	0	0	2
California	13	23	29	1,023	7	68	476	86	258	16	9	23
Total	219	340	340	10,360	4,728	4,728	7,372	4,215	5,314	92	100	262
2 weeks	477	706	706	20,695	8,393	8,719	14,608	7,210	8,083	177	183	489
Seasonal low week [4]	(27th) July 5-11			(30th) July 26-Aug. 1			(35th) Aug. 30-Sept. 5			(37th) Sept. 13-19		
Total since low	6,835	8,272	9,149	64,253	41,368	41,368	49,554	30,097	34,207	959	1,155	1,957

[1] New York City only. [2] Philadelphia only. [3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended Jan. 17, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	Jan. 17, 1948	Jan. 11, 1947		Jan. 17, 1948	Jan. 11, 1947		Jan. 17, 1948	Jan. 11, 1947		Jan. 17, 1948[5]	Jan. 11, 1947	
NEW ENGLAND												
Maine	0	1	0	14	27	27	0	0	0	0	1	0
New Hampshire	0	0	0	2	3	9	0	0	0	0	0	0
Vermont	0	0	0	5	4	4	0	0	0	1	1	0
Massachusetts	0	1	1	120	148	241	0	0	0	2	4	0
Rhode Island	0	0	0	9	5	14	0	0	0	0	0	0
Connecticut	0	1	0	43	32	57	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	4	4	4	210	286	399	0	0	0	2	3	3
New Jersey	0	0	0	62	102	103	0	0	0	0	0	1
Pennsylvania	4	0	0	204	159	272	0	0	0	3	2	2
EAST NORTH CENTRAL												
Ohio	0	0	1	237	309	265	0	1	0	0	0	1
Indiana	1	7	1	56	82	83	0	0	0	0	1	1
Illinois	1	2	1	122	127	223	0	0	0	1	3	1
Michigan[3]	1	2	2	136	119	118	0	0	0	0	0	0
Wisconsin	0	0	0	71	88	141	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	1	1	1	40	35	63	0	0	0	0	0	0
Iowa	0	2	1	40	33	63	0	0	0	0	1	0
Missouri	0	2	1	37	34	76	1	0	0	0	1	1
North Dakota	0	0	0	7	4	12	0	0	0	0	0	0
South Dakota	0	1	0	8	4	23	0	0	0	0	0	0
Nebraska	0	1	0	40	38	33	0	0	0	0	0	0
Kansas	0	5	0	25	42	64	0	0	1	0	1	0
SOUTH ATLANTIC												
Delaware	0	0	0	9	5	5	0	0	0	0	0	0
Maryland[3]	0	0	0	27	37	66	0	0	0	0	0	0
District of Columbia	0	0	0	10	16	25	0	0	0	0	0	0
Virginia	0	0	0	27	52	53	0	0	0	2	1	1
West Virginia	1	1	0	14	24	53	0	0	0	1	0	0
North Carolina	2	4	1	20	19	52	0	0	0	0	1	1
South Carolina	0	0	0	4	19	17	0	0	0	0	0	1
Georgia	0	1	0	11	9	13	0	1	0	0	1	1
Florida	1	3	1	11	18	8	0	0	0	1	0	1
EAST SOUTH CENTRAL												
Kentucky	1	0	0	42	41	43	0	0	0	2	0	1
Tennessee	0	4	1	40	30	57	0	1	0	4	5	2
Alabama	0	1	1	12	14	15	0	0	1	0	1	0
Mississippi[3]	0	3	0	11	10	13	0	0	0	1	4	1
WEST SOUTH CENTRAL												
Arkansas	0	2	1	5	3	8	0	2	0	0	0	0
Louisiana	1	2	0	7	5	10	0	0	0	2	3	4
Oklahoma	0	0	0	42	6	18	0	0	1	0	0	1
Texas	0	7	1	40	41	62	0	0	0	3	5	5
MOUNTAIN												
Montana	0	0	0	23	3	21	0	0	0	0	0	0
Idaho	0	7	0	7	16	16	1	0	0	0	0	0
Wyoming	0	1	1	1	3	9	0	0	0	0	0	0
Colorado	1	2	1	16	45	45	1	0	0	0	0	0
New Mexico	0	0	0	8	14	13	0	0	0	0	0	0
Arizona	0	0	1	7	5	11	1	0	0	0	0	1
Utah[3]	2	0	0	20	17	67	0	0	0	0	0	0
Nevada	0	0	0	3	0	0	0	0	0	0	0	0
PACIFIC												
Washington	10	2	1	80	42	42	0	0	0	0	2	1
Oregon	4	2	1	26	23	23	0	0	0	1	0	0
California	5	19	7	80	138	195	0	0	0	0	2	2
Total	40	91	46	2,091	2,336	3,637	4	5	9	26	43	43
2 weeks	81	170	84	4,088	4,416	7,094	8	8	21	71	81	81
Seasonal low week[4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	10,292	24,960	13,448	26,627	31,102	45,415	29	62	104	3,480	3,609	4,657

---

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately as follows: Vermont 1; Massachusetts 2 (salmonella infection); Oregon 1.

Telegraphic morbidity reports from State health officers for the week ended Jan. 17, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended Jan. 17, 1948							
	Week ended—		Median 1943-47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Jan. 17, 1948	Jan. 11, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	13	17	34								1
New Hampshire			3								
Vermont	51	19	34				1				2
Massachusetts	119	196	189		3		1				1
Rhode Island	6	9	18								
Connecticut	27	46	83	1							6
MIDDLE ATLANTIC											
New York	154	298	298	5	5		1			1	9
New Jersey	69	123	123	4							1
Pennsylvania	133	221	173	2							2
EAST NORTH CENTRAL											
Ohio	107	88	89	1							
Indiana	29	34	23								
Illinois	73	104	77	6	3		1		1		13
Michigan [3]	134	171	122	2	3						5
Wisconsin	86	149	80								1
WEST NORTH CENTRAL											
Minnesota	79	6	32								5
Iowa	16	9	9	1							2
Missouri	26	21	13						3		
North Dakota	5		4								
South Dakota	4		2								2
Nebraska	19	11	3								4
Kansas	45	8	34								
SOUTH ATLANTIC											
Delaware	1	9	3								
Maryland [3]	44	80	77			5			2		
District of Columbia	11	11	9								
Virginia	66	31	39	1		47			4		1
West Virginia	14	36	31								
North Carolina	29	67	77	1				1	1	1	
South Carolina	56	66	64						1	1	3
Georgia	26	4	7	1	1				2	3	
Florida	24	32	25	3			1		1	2	
EAST SOUTH CENTRAL											
Kentucky	20	43	38			1			1		
Tennessee	38	23	23	1		2			2		1
Alabama	25	28	28							3	2
Mississippi [3]	3			4					1	3	
WEST SOUTH CENTRAL											
Arkansas	52	9	9			1					2
Louisiana	15	5	2	2					2		
Oklahoma	38	5	5						2		1
Texas	381	240	174	23	301	257			1	5	10
MOUNTAIN											
Montana	10	2	6								
Idaho	6	3	2								
Wyoming	6		5								
Colorado	71	9	23								3
New Mexico	7		3								1
Arizona	29	18	18			11					1
Utah [3]	13	12	8								3
Nevada											
PACIFIC											
Washington	43	23	33								
Oregon	7	8	10								
California	98	57	132	3	4					2	9
Total	2,328	2,351	2,263	61	320	324	5	1	24	21	91
Same week: 1947	2,351			18	427	124	8	0	43	62	67
Median, 1943-47	2,263			31	405	124	8	0	32	70	[6] 69
2 weeks: 1948	4,745			100	741	910	10	2	64	41	161
1947	4,097			55	749	597	12	1	94	99	153
Median, 1943-47	4,097			54	749	263	14	0	54	142	[6] 124

[3] Period ended earlier than Saturday.

[6] 3-year median, 1945-47.

Anthrax: Massachusetts, 1 case; Pennsylvania, 1 case.
Leprosy: California, 2 cases.
Alaska: Scarlet fever 2.
Territory of Hawaii: Influenza 1, measles 1, whooping cough 21.

WEEKLY REPORTS FROM CITIES *

City reports for week ended Jan. 10, 1948

This table lists the reports from 90 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	------	0	2	0	2	0	0	17
New Hampshire:												
Concord	0	0	------	0	------	0	0	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	0	0	------	0	188	1	15	0	17	0	0	18
Fall River	0	0	------	0	1	0	5	0	0	0	0	4
Springfield	0	0	1	0	------	0	2	0	1	0	0	6
Worcester	0	0	------	0	------	0	0	0	10	0	0	
Rhode Island:												
Providence	0	0	------	1	------	0	2	0	5	0	0	9
Connecticut:												
Bridgeport	0	0	------	0	1	0	0	0	0	0	0	2
Hartford	0	0	------	0	------	0	3	1	1	0	0	8
New Haven	0	0	1	0	------	1	3	0	0	0	0	6
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0	------	0	1	0	16	0	6	0	0	21
New York	10	1	1	5	362	6	92	1	53	0	0	40
Rochester	0	0	------	1	------	0	2	1	10	0	0	4
Syracuse	0	0	------	0	3	0	2	0	12	0	0	9
New Jersey:												
Camden	1	0	------	0	------	0	6	0	1	0	0	------
Newark	0	0	2	0	15	1	10	0	11	0	0	12
Trenton	1	0	------	0	8	0	2	0	0	0	0	2
Pennsylvania:												
Philadelphia	1	0	28	0	51	0	39	0	55	0	1	33
Pittsburgh	0	0	1	2	------	2	9	1	1	0	1	6
Reading	0	0	------	0	2	0	1	0	2	0	0	3
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	1	25	1	3	0	17	0	0	2
Columbus	5	0	------	0	70	0	6	0	4	0	0	9
Indiana:												
Fort Wayne	1	0	------	0	2	0	0	0	3	0	0	1
Indianapolis	1	0	------	0	35	0	9	0	6	0	0	4
South Bend	0	0	------	0	4	0	0	0	1	0	0	3
Terre Haute	0	0	------	0	12	1	1	0	2	0	0	------
Illinois:												
Chicago	0	0	------	0	375	5	23	1	37	0	0	25
Springfield	0	0	------	0	------	0	2	0	0	0	0	------
Michigan:												
Detroit	0	0	------	1	17	1	9	0	31	0	0	32
Flint	0	0	------	0	------	0	3	0	6	0	0	------
Grand Rapids	0	0	------	0	162	0	0	0	4	0	0	9
Wisconsin:												
Kenosha	0	0	------	0	16	0	0	0	1	0	0	------
Milwaukee	0	1	------	0	6	2	5	0	16	0	0	16
Racine	0	0	------	0	22	0	1	0	4	0	0	------
Superior	0	0	------	0	1	0	2	0	1	0	0	3
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	1	0	1	0	8	0	0	21
Minneapolis	1	0	------	0	243	0	4	0	13	0	0	39
St. Paul	3	0	------	0	8	0	3	0	6	0	0	9
Missouri:												
Kansas City	1	0	7	0	3	0	11	0	7	0	0	7
St. Joseph	0	0	------	0	------	0	0	1	1	0	1	1
St. Louis	4	1	2	1	5	0	12	0	14	0	2	4

---

* In some instances the figures include nonresident cases.

City reports for week ended Jan. 10, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	20	0	1	0	0	0	0	8
Nebraska:												
Omaha	0	0	------	0	------	1	3	0	3	0	0	5
Kansas:												
Topeka	0	0	------	0	------	0	1	0	1	0	0	11
Wichita	0	0	------	0	------	0	7	0	2	0	0	5
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	1	------	0	9	0	4	0	2	0	0	------
Maryland:												
Baltimore	1	0	------	0	1	0	7	0	12	0	0	29
Cumberland	9	0	------	0	------	0	0	0	0	0	0	------
Frederick	1	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	44	2	9	0	13	0	0	7
Virginia:												
Lynchburg	0	0	------	0	------	0	3	0	2	0	0	------
Richmond	0	0	------	1	------	0	6	0	0	0	0	25
Roanoke	0	0	------	0	------	0	0	0	1	0	0	------
West Virginia:												
Charleston	0	0	------	0	1	0	6	1	0	0	0	1
Wheeling	0	0	------	0	------	0	1	0	1	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	0	4	0	0	0	0	7
Wilmington	1	0	------	0	------	0	3	0	0	0	0	----
Winston-Salem	0	0	------	0	------	0	3	0	2	0	0	7
South Carolina:												
Charleston	0	0	35	1	------	0	2	0	2	0	0	4
Georgia:												
Atlanta	0	0	31	1	------	2	6	0	3	0	0	2
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Savannah	0	0	2	0	------	0	0	0	2	0	0	3
Florida:												
Tampa	3	0	------	0	12	0	2	0	0	0	0	5
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	1	15	1	12	0	3	0	0	6
Nashville	0	0	------	1	------	0	5	0	3	0	0	------
Alabama:												
Birmingham	0	0	3	1	------	0	4	0	2	0	0	------
Mobile	1	0	13	2	------	0	3	0	1	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	5	0	1	0	0	0	0	0	0	------
Louisiana:												
New Orleans	2	0	1	1	------	1	7	0	3	0	0	3
Shreveport	0	0	------	0	------	0	6	0	1	0	0	------
Oklahoma:												
Oklahoma City	0	0	8	0	1	1	1	0	2	0	0	2
Texas:												
Dallas	0	0	------	0	1	0	4	0	2	0	0	8
Galveston	0	0	------	1	------	0	1	0	0	0	0	1
Houston	1	0	------	0	19	0	7	0	1	0	0	3
San Antonio	0	0	------	1	------	0	11	1	0	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	22	0	0	0	0	0	0	------
Great Falls	1	0	------	0	------	0	2	0	0	0	0	------
Helena	3	0	------	0	------	0	0	0	0	0	0	------
Missoula	0	0	------	0	------	0	1	0	0	0	0	------
Idaho:												
Boise	0	0	------	0	------	0	0	1	0	0	0	1
Colorado:												
Denver	2	0	4	0	39	0	1	0	11	0	0	15
Pueblo	0	0	------	0	------	0	1	0	6	0	0	28
Utah:												
Salt Lake City	0	0	------	0	9	0	2	1	2	0	0	3

City reports for week ended Jan. 10, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	2	0	------	0	4	0	5	2	8	0	0	7
Spokane	0	0	------	0	1	0	1	0	0	0	0	------
Tacoma	0	0	------	0	59	0	0	0	3	0	0	1
California:												
Los Angeles	4	0	668	8	18	2	5	0	17	0	0	22
Sacramento	0	0	1	1	1	1	0	0	1	0	0	2
San Francisco	0	0	3	0	160	0	12	0	8	0	0	2
Total	61	4	817	32	2,076	32	465	12	489	0	5	612
Corresponding week, 1947[1]	90	------	50	16	687	------	399	------	443	0	5	489
Average 1943–47[1]	75	------	1,428	[2] 51	[3] 1,501	------	[2] 484	------	891	0	9	565

[1] Exclusive of Oklahoma City. [2] 3-year average, 1945–47. [3] 5-year median, 1943–47.

Dysentery, amebic.—Cases: Buffalo 1; Chicago 1; St. Louis 1; Atlanta 1; Los Angeles 4.
Dysentery, bacillary.—Cases: Worcester 1; Providence 2; Flint 1; Memphis 1; Los Angeles 3.
Dysentery, unspecified.—Cases: San Antonio 2.
Tularemia.—Cases: Kansas City 1; Nashville 2.

Rates (annual basis) per 100,000 population, by geographic groups, for the 90 cities in the preceding table (latest available estimated population, 33,745,800)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	0.0	0.0	5.2	2.6	497	5.2	83.6	2.6	94	0.0	0.0	193
Middle Atlantic	6.5	0.5	14.8	3.7	205	4.2	82.8	1.4	70	0.0	0.9	60
East North Central	4.7	0.7	0.0	1.4	506	6.8	43.4	0.7	90	0.0	0.0	70
West North Central	17.9	2.0	17.9	2.0	557	2.0	85.5	2.0	109	0.0	6.0	219
South Atlantic	24.5	1.6	111.1	4.9	110	6.5	91.5	1.6	65	0.0	0.0	147
East South Central	5.9	0.0	94.4	29.5	89	5.9	141.6	0.0	53	0.0	0.0	35
West South Central	7.6	0.0	35.6	7.6	56	5.1	94.0	2.5	23	0.0	0.0	43
Mountain	47.7	0.0	31.8	0.0	556	0.0	55.6	15.9	151	0.0	0.0	373
Pacific	9.5	0.0	1,062.8	14.2	384	4.7	36.4	3.2	59	0.0	0.0	54
Total	9.5	0.6	126.6	5.0	322	5.0	72.0	1.9	76	0.0	0.8	95

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—5 weeks ended January 3, 1948.—During the 5 eeks ended January 3, 1948, cases of notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chickenpox	18	Syphilis	170
Diphtheria	163	Tetanus	16
Dysentery	6	Tetanus, infantile	2
Gonorrhea	235	Tuberculosis (all forms)	896
Influenza	106	Typhoid fever	9
Malaria	294	Typhus fever (murine)	5
Measles	416	Whooping cough	149
Poliomyelitis	2		

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended December 27, 1947.—During the week ended December 27, 1947, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		27	1	176	228	43	40	38	24	577
Diphtheria		1		19	5	1		6		32
German measles				7	8	1	1	6	4	27
Influenza		4			4					8
Measles		1		528	315	19	5	27	4	899
Meningitis, meningococcus					1			1	1	3
Mumps		7	1	211	72	10	19	20	8	348
Poliomyelitis		2			3					5
Scarlet fever		2	4	20	64	2	2	8	2	104
Tuberculosis (all forms)		5	15	69	16	39	2		22	168
Typhoid and paratyphoid fever				4					1	5
Undulant fever					1				2	3
Venereal diseases:										
Gonorrhea	2	5	11	40	61	25	17	38	31	230
Syphilis		10	9	29	25	2	4	3	14	96
Other forms									2	2
Whooping cough		2		43	34	9	1	19	5	113

JAMAICA

Notifiable diseases—5 weeks ended January 3, 1948.—During the 5 weeks ended January 3, 1948, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	2	1	Leprosy	1	2
Chickenpox	6		Tuberculosis	52	68
Diphtheria	5	3	Typhoid fever	9	123
Dysentery	4	4	Typhus fever (murine)	2	
Erysipelas	1				

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Plague

China—Yunnan Province.—For the period April to November 1947, inclusive, approximately 770 cases of plague with about 220 deaths had occurred in the western part of Yunnan Province, China.

Madgascar.—Plague infection has been reported in Madagascar as follows: December 1–10, 1947, 15 cases, 14 deaths; December 11–20, 1947, 10 cases, 7 deaths.

Smallpox

China—Shanghai.—For the week ended January 3, 1948, 58 cases of smallpox were reported in Shanghai, China.

India—Calcutta.—For the week ended January 3, 1948, 329 cases of smallpox were reported in Calcutta, India.

Tunisia.—For the month of November 1947, 206 cases of smallpox were reported in all of Tunisia. On December 13, 1947, 15 cases of smallpox were reported in Tunis and suburbs and 34 cases were reported in the interior of Tunisia.

Yellow Fever

Belgian Congo—Orientale Province—Bondo.—On November 20, 1947, 1 fatal case of yellow fever was reported in the region of Bondo, Orientale Province, Belgian Congo, and pathologically confirmed January 7, 1948. The last previously reported case of yellow fever in Belgian Congo was during the year 1944.

DEATHS DURING WEEK ENDED JAN. 10, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Jan. 10, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	11,313	10,638
Median for 3 prior years	10,638	
Total deaths, first 2 weeks of year	21,731	20,847
Deaths under 1 year of age	822	863
Median for 3 prior years	661	
Deaths under 1 year of age, first 2 weeks of year	1,547	1,677
Data from industrial insurance companies:		
Policies in force	66,844,594	67,231,066
Number of death claims	14,153	11,563
Death claims per 1,000 policies in force, annual rate	11.1	9.0
Death claims per 1,000 policies, first 2 weeks of year, annual rate	8.5	8.4

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. : 1948

For sale by the Superintendent of Documents, United States Government Printing Office Washington 25, D.C.

Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 FEBRUARY 13, 1948 NUMBER 7

IN THIS ISSUE

Negro Mortality, Trends, 1920–44

Q Fever Studies in Southern California

Two New Salmonella Types

U.S. PUBLIC HEALTH SERVICE
1798

CONTENTS

Page

Negro mortality, III. Course of mortality from specific causes, 1920–44. Mary Gover ... 201
Deaths during week ended January 17, 1948 ... 213
Q fever studies in Southern California, I. Recovery of *Rickettsia burneti* from raw milk. R. J. Huebner, W. L. Jellison, M. D. Beck, R. R. Parker and C. C. Shepard ... 214
Two new *Salmonella* types. James Watt, Thelma M. DeCapito, P. R. Edwards and Alice B. Moran ... 223

INCIDENCE OF DISEASE

United States:

Reports from States for week ended January 24, 1948, and comparison with former years ... 225

Weekly reports from cities:

City reports for week ended January 17, 1948 ... 229
Rates, by geographic divisions, for a group of selected cities ... 231

Foreign reports:

Canada—Provinces—Communicable diseases—Week ended January 3, 1948 ... 232

Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—

Smallpox ... 232
Yellow fever ... 232

Public Health Reports

Vol. 63 • FEBRUARY 13, 1948 • *No. 7*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

NEGRO MORTALITY

III. COURSE OF MORTALITY FROM SPECIFIC CAUSES, 1920–1944[1]

By MARY GOVER, *Biostatistician, United States Public Health Service*

The course of mortality from specific causes is of great importance in considering the general aspects of Negro mortality in the United States. In presenting the trend of mortality it is well to control as many of the major factors affecting mortality as practical. Age is of prime importance in this connection; sex is relatively less so since males and females are usually about equally represented in a population; a constant area is advisable. However, the area of the expanding death registration States includes the entire country from 1933 on, and for every year it comprises all of the Negro population living in States where registration of deaths met the requirements set by the Bureau of the Census.

Differences in the age distribution of nonwhite and white populations are clearly marked in any enumeration, the nonwhite population having proportionately more children and fewer old people than the white. In the 1940 Census, among nonwhite and white, respectively, 9.8 and 7.8 percent of the population were children under 5 years of age and 4.8 and 7.1 percent were persons 65 years of age or older. Not only do the age distributions of nonwhite and white populations differ at a specific time but there has been a gradual aging of the population evident in successive enumerations. The percentage of persons 65 years and over in the 1920, 1930, and 1940 enumerations was 3.2, 3.2, and 4.8 for nonwhite and 4.8, 5.7, and 7.1 percent for white, respectively.

Adjustment of mortality rates at all ages for differences in age composition of the population for comparative purposes has been made by the direct method of adjustment, that is, by applying observed age-specific rates to a population chosen as standard.[2] Since (1) nonwhite and white rates are adjusted to the same standard population, namely, the total enumerated population of the United States in 1940, and since (2) the enumerated nonwhite population is relatively younger than the white, it follows that age adjustment of the crude rates frequently raises the nonwhite rate by a considerable amount, and on the other hand makes a comparatively small change in the white rate. This is the case when crude nonwhite and white rates for 1940 are adjusted to the total population in 1940 with the result that nonwhite rates are higher and white are lower than before adjustment for age has been made. In the present study of *trends* of mortality a further purpose of age-adjustment of crude rates is to make a comparison of successive annual rates of nonwhite and white mortality uninfluenced by age changes in the populations. Such age changes in the past have been more rapid for white than nonwhite elements of our population. The rate of decrease of age-adjusted rates for all causes can be compared also, since adjustment has been made to the same standard population for both nonwhite and white mortality.

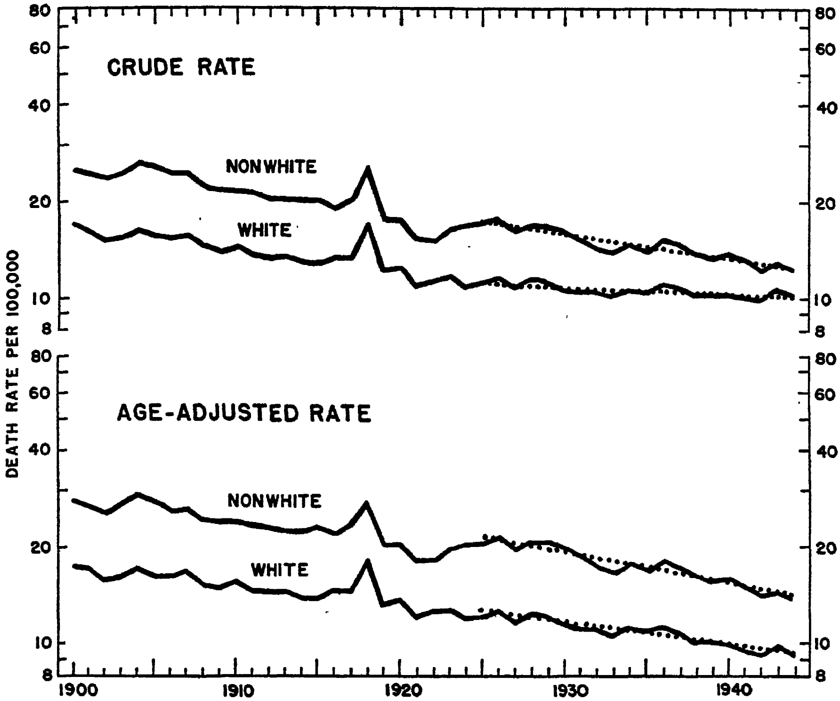
---

[1] From the Division of Public Health Methods. This is the third in a series of studies of Negro mortality (*1*) consisting of data assembled principally from reports of the U. S. Bureau of the Census and prepared at the request of the Office of Negro Health Work, U. S. Public Health Service.

[2] For further details of the method see Raymond Pearl: Medical Biometry and Statistics, 3rd edition, pp. 274–278.

In the charts which follow, annual rates for those causes of death which have a high mortality in old age have been adjusted for age (figs. 3 and 4); the remainder (figs. 2, 5, 6, and 7) are constructed from crude rates. In adjusting for age the following method was used: rates specific for cause and color for the years 1920–21, 1929–31, 1939–41, 1941, 1942, and 1943 were adjusted for age in the usual way, using the enumerated population of the United States in 1940 as the standard. The ratio of the adjusted to the crude rate was computed for the same years, interpolations between these ratios giving annual ratios for successive intervening years. The annual ratios were then applied to the crude rates to obtain an age-adjusted rate for each year (see footnote 8, table 2). Since age-specific populations must be obtained by interpolation between census enumerations in order to adjust each annual rate for age by the direct method, it seems that the shorter method of interpolating the ratio and applying it to the crude rate for each year is accurate enough.

Figure 1 shows the rate of decline of nonwhite and white mortality from all causes for both crude and age-adjusted rates in the expanding area of the death registration States, from 1900 to 1944. Prior to 1925 the death registration States included a relatively small proportion of the total nonwhite population; 5 percent in 1900, 12 percent in 1910, 66 percent in 1920, and 86 percent in 1930. For this reason the period 1925–44 was chosen for the construction of trend lines. Straight lines have been fitted by the method of least squares to the logarithms of the nonwhite and white rates, both crude and adjusted, for 1925 to 1944. The average annual percentage decline of the fitted lines and the probable error of the decline is shown in figure 1; namely, crude nonwhite, -1.77 ± 0.095; crude white, -0.49 ± 0.075; age-



	DEATH RATE PER 100,000			
	CRUDE		ADJUSTED	
YEAR	NONWHITE	WHITE	NONWHITE	WHITE
1919-1921	17.0	12.0	19.8	13.1
1929-1931	16.2	10.9	20.0	11.8
1939-1941	13.5	10.3	15.9	10.0
AVERAGE ANNUAL PERCENTAGE CHANGE				
1930 to 1940 (average rates)	-1.7	-.6	-2.1	-1.5
1925 to 1944 (fitted line)	-1.77 ±.095	-.49 ±.075	-2.08 ±.099	-1.51 ±.090

FIGURE 1.—Crude and age-adjusted mortality from all causes, nonwhite and white persons in the death registration States, 1900–1944. Trend lines, represented by dotted lines, have been fitted to the logarithms of the rates, 1925–1944.

adjusted nonwhite, −2.08±0.099; and age-adjusted white, −1.51 ±0.090.[3]

---

[3] The average annual percentage decline and probable error was computed from straight lines fitted to the logarithms of annual rates as follows:

$Y = A + BX$ where Y is the logarithm of the observed rate

$b = (\text{antilog of } B) - 1$ where b is the average annual percentage change in the rates

$\sigma_B = \dfrac{\bar{\sigma}}{\sqrt{\Sigma(x-\bar{x})^2}}$, where $\bar{\sigma}$ is the square root of the sum of the squares of the differences between the observed and calculated values of Y (logarithms) divided by n−2, in which n is the number of years (20) used in fitting the straight line, and $\Sigma(x-\bar{x})^2$ is the sum of the squares of the deviations of x from the mean of x.

$$PE_b = 0.67449 \frac{(1+b)\sigma_B}{0.4342945}$$

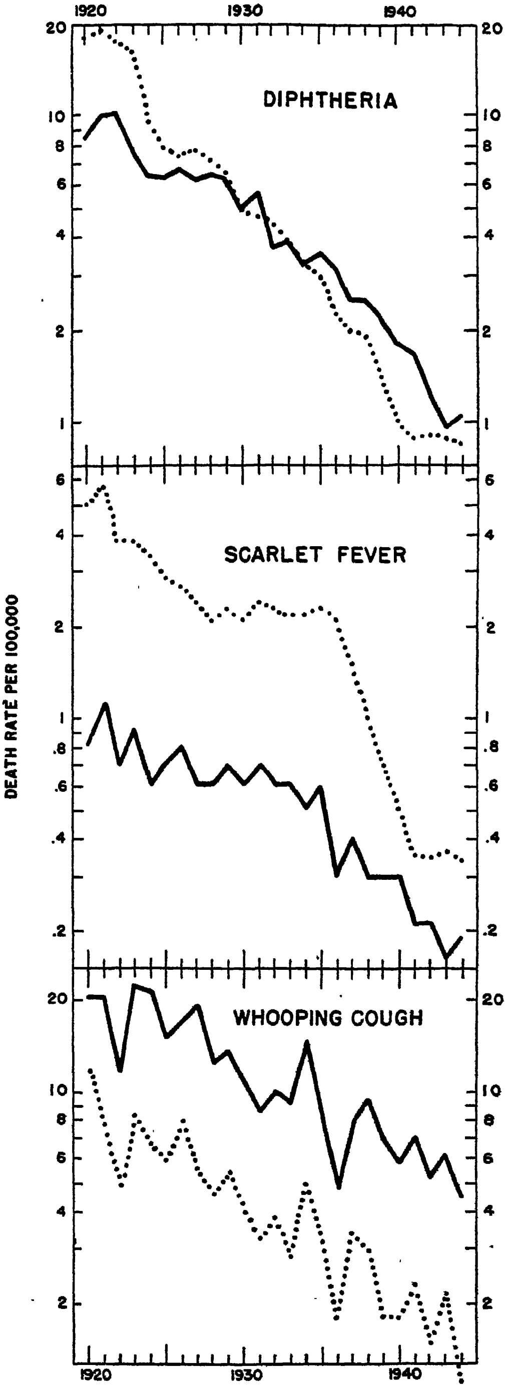
The rate of decline in mortality during the last 20 years is increased by age-adjustment of the crude rates for both nonwhite and white persons (fig. 1). The change in the annual rate of decline brought about by adjustment for age is not significant for the nonwhite, that is, from −1.77±0.095 to −2.08±0.099 percent; while for the white the change from −0.49±0.075 to −1.51±0.090 percent is statistically significant. That is, age-adjustment of mortality from all causes increases the rate of decline in the rates only slightly for nonwhite and significantly so for white.

During the last 20 years crude rates of mortality from all causes have been declining at a somewhat faster rate for nonwhite than white (fig. 1). Rates adjusted for age also show a more rapid rate of decline for nonwhite. The difference between the rates of decline for nonwhite and white is less for age-adjusted than for crude rates, owing to the greater acceleration in the rate of decline of the white rates occasioned by age-adjustment. The difference between the rate of decline (1925–44) in age-adjusted nonwhite mortality, −2.08±0.099 percent, and that for white, −1.51±0.090 percent, is −0.57±0.134 percent, or a small but significant difference.

In the charts (figs. 2–7) which follow, showing the trend of mortality from specific causes, the rates of decline are predominantly faster among whites, in spite of the more rapid rate of decline in mortality from all causes among the nonwhite. The chief reason for the apparent discrepancy is the faster rate of decline in the relatively large rate for ill-defined causes among the nonwhite. Other contributing factors are the absence of any marked increase in heart disease mortality among nonwhite, and the fact that tuberculosis, which is declining rapidly, is a relatively larger part of the total death rate among nonwhite.

Figures 2–7 show the course of mortality from selected causes among nonwhite and white and are self-explanatory. The rates are for the expanding death registration States and have been adjusted for age for the causes shown in figures 3 and 4; crude rates are shown in figures 2 and 5–7. Average rates for three successive decades are tabled opposite the charts for each specific cause together with the average annual increase or decrease in the rates from 1930 to 1940.

Communicable diseases (fig. 2) including tuberculosis (fig. 3) have decreased rapidly in recent years. The slower rate of decline for the nonwhite may be associated with a lower rate of immunization and less extensive use of the sulfa-compounds. Pneumonia (fig. 4), pellagra (fig. 5) and malaria (fig. 5) have also shown spectacular rates of decline. Syphilis (fig. 4) has been declining in very recent years among nonwhite.



Death rate per 100,000

Year	Non-white	White
1919–21	8.7	16.7
1929–31	5.6	5.4
1939–41	1.9	1.1

Average annual percentage change

	Non-white	White
1930–40	−6.6	−8.0

Death rate per 100,000

Year	Non-white	White
1919–21	0.82	4.57
1929–31	.70	2.25
1939–41	.26	.53

Average annual percentage change

	Non-white	White
1930–40	−6.3	−7.6

Death rate per 100,000

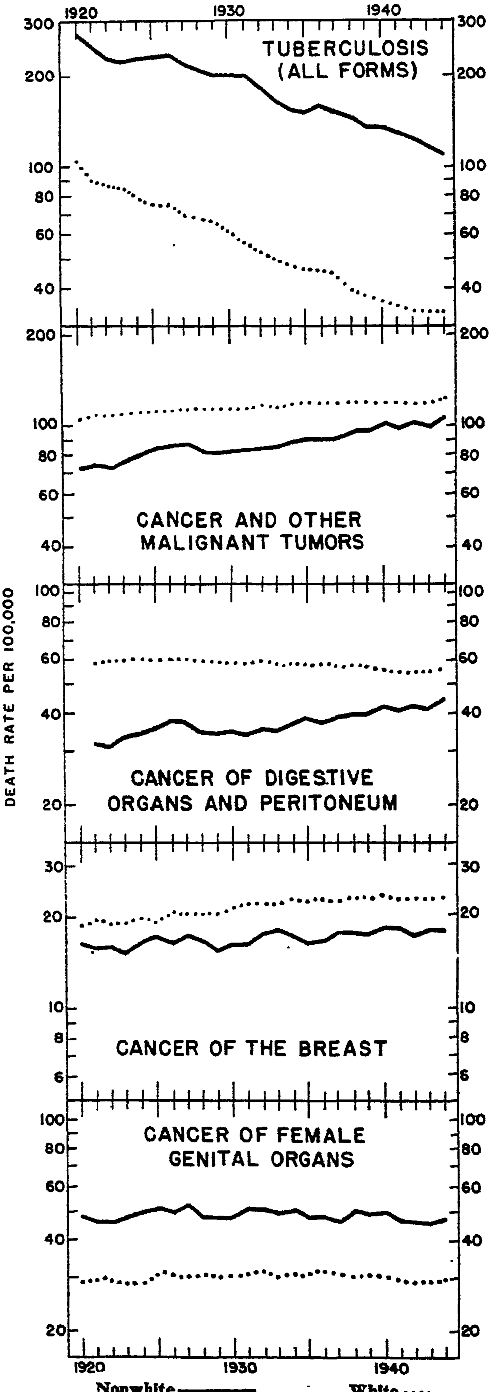
Year	Non-white	White
1919–21	17.7	8.2
1929–31	11.2	4.3
1939–41	6.7	2.0

Average annual percentage change

	Non-white	White
1930–40	−4.0	−5.3

Nonwhite ——— White ······

FIGURE 2.—Crude rates of mortality from selected causes—nonwhite and white mortality in the death registration States, 1920–1944.



Death rate per 100,000

Year	Crude Non-White	Crude White	Adj uste Non-White	Adj uste White
1920–21	250.9	92.1	261.6	97.1
1929–31	191.7	58.1	199.4	60.8
1939–41	126.4	36.5	132.0	36.1

Average annual percentage change

	Adjusted Non-white	Adjusted White
1930–40	−3.4	−4.1

Death rate per 100,000

Year	Crude Non-White	Crude White	Adjusted Non-White	Adjusted White
1920–21	48.9	87.7	73.4	107.4
1929–31	56.9	101.9	83.0	115.0
1939–41	76.2	124.0	99.5	120.5

Average annual percentage change

	Adjusted Non-white	Adjusted White
1930–40	+2.0	+0.5

Death rate per 100,000

Year	Crude Non-White	Crude White	Adjusted Non-White	Adjusted White
1921	20.0	47.5	31.5	59.0
1929–31	22.8	51.8	34.8	59.0
1939–41	30.4	57.7	40.9	55.9

Average annual percentage change

	Adjusted Non-white	Adjusted White
1930–40	+1.8	−0.5

Death rate per 100,000

Year	Crude Non-White	Crude White	Adjusted Non-White	Adjusted White
1920–21	9.9	16.1	16.3	19.4
1929–31	10.6	19.3	16.2	21.5
1939–41	13.6	24.0	18.1	23.3

Average annual percentage change

	Adjusted Non-white	Adjusted White
1930–40	+1.2	+0.8

Death rate per 100,000

Year	Crude Non-White	Crude White	Adjusted Non-White	Adjusted White
1920–21	30.8	24.5	47.1	29.2
1929–31	33.8	27.5	48.7	30.5
1939–41	37.8	31.2	48.3	30.4

Average annual percentage change

	Adjusted Non-white	Adjusted White
1930–40	−0.1	−0.03

FIGURE 3.—Age-adjusted rates of mortality from selected causes—nonwhite and white mortality in the death registration States, 1920–1944.

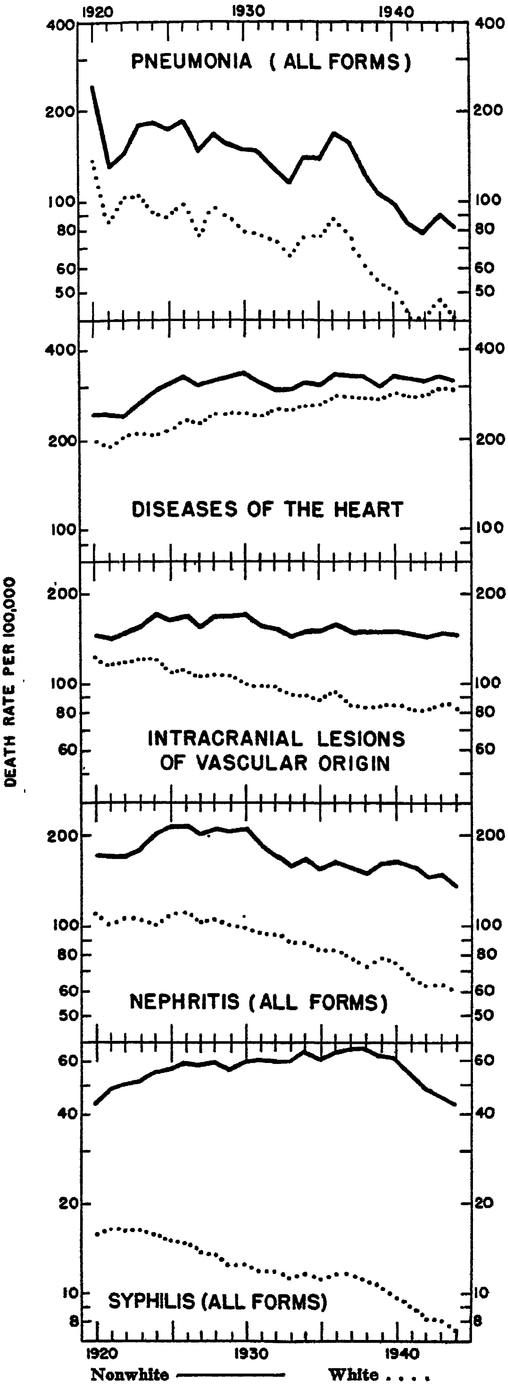


FIGURE 4.—Age-adjusted rates of mortality from selected causes—nonwhite and white mortality in the death registration States, 1920–1944.

Death rate per 100,000

Year	Crude Non-White	Crude White	Adjusted Non-White	Adjusted White
1919–21	160.7	107.7	167.8	111.8
1929–31	140.1	79.1	150.8	82.8
1939–41	91.4	49.7	97.2	48.7

Average annual percentage change

	Adjusted Non-white	Adjusted White
1930–40	−3.6	−4.1

Death rate per 100,000

Year	Crude Non-White	Crude White	Adjusted Non-White	Adjusted White
1919–21	160.7	157.7	245.5	196.7
1929–31	217.6	212.4	325.3	243.4
1939–41	239.2	290.8	320.9	281.9

Average annual percentage change

	Adjusted Non-white	Adjusted White
1930–40	−0.1	+1.6

Death rate per 100,000

Year	Crude Non-White	Crude White	Adjusted Non-White	Adjusted White
1919–21	86.7	91.5	144.2	117.7
1929–31	104.9	87.1	164.7	101.1
1939–41	109.7	86.8	150.1	84.0

Average annual percentage change

	Adjusted Non-white	Adjusted White
1930–40	−0.9	−1.7

Death rate per 100,000

Year	Crude Non-White	Crude White	Adjusted Non-White	Adjusted White
1919–21	110.5	84.3	172.1	104.8
1929–31	133.5	85.0	203.4	97.3
1939–41	120.3	75.0	162.0	72.8

Average annual percentage change

	Adjusted Non-white	Adjusted White
1930–40	−2.0	−2.5

Death rate per 100,000

Year	Crude Non-White	Crude White	Adjusted Non-White	Adjusted White
1919–21	40.9	14.9	45.9	16.1
1929–31	51.6	11.6	58.7	12.3
1939–41	52.3	9.9	59.4	9.6

Average annual percentage change

	Adjusted Non-white	Adjusted White
1930–40	+0.1	−2.2

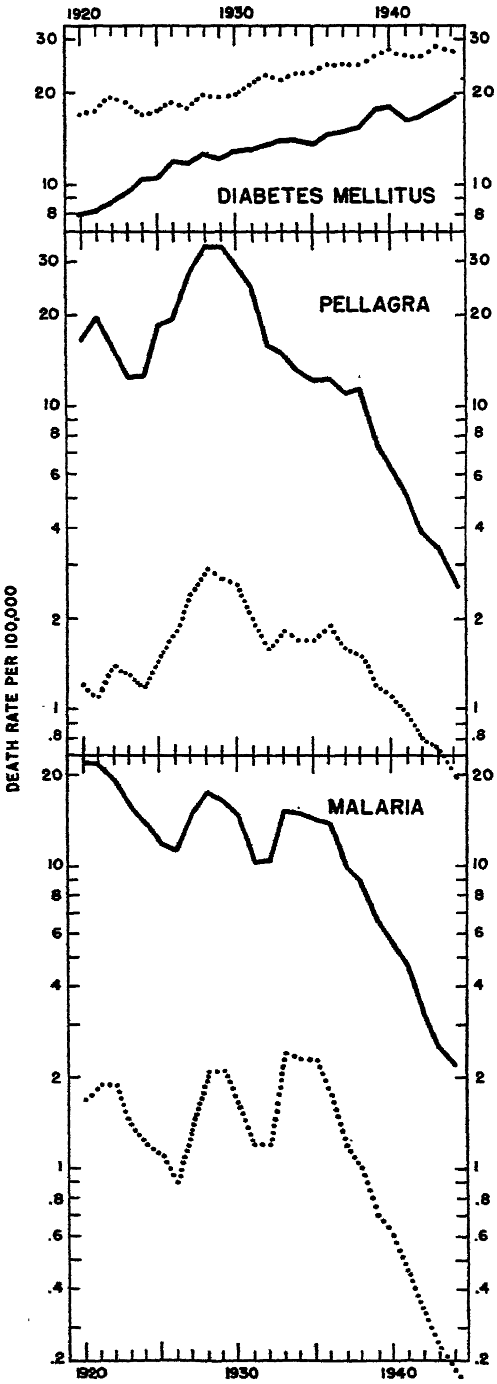


FIGURE 5.—Crude rates of mortality from selected causes—nonwhite and white mortality in the death registration States, 1920–1944.

Death rate per 100,000

Year	Non-white	White
1919–21	7.5	16.7
1929–31	12.7	20.2
1939–41	17.3	26.8

Average annual percentage change

	Non-white	White
1930–40	+3.6	+3.3

Death rate per 100,000

Year	Non-white	White
1919–21	18.2	1.3
1929–31	28.9	2.4
1939–41	6.3	1.1

Average annual percentage change

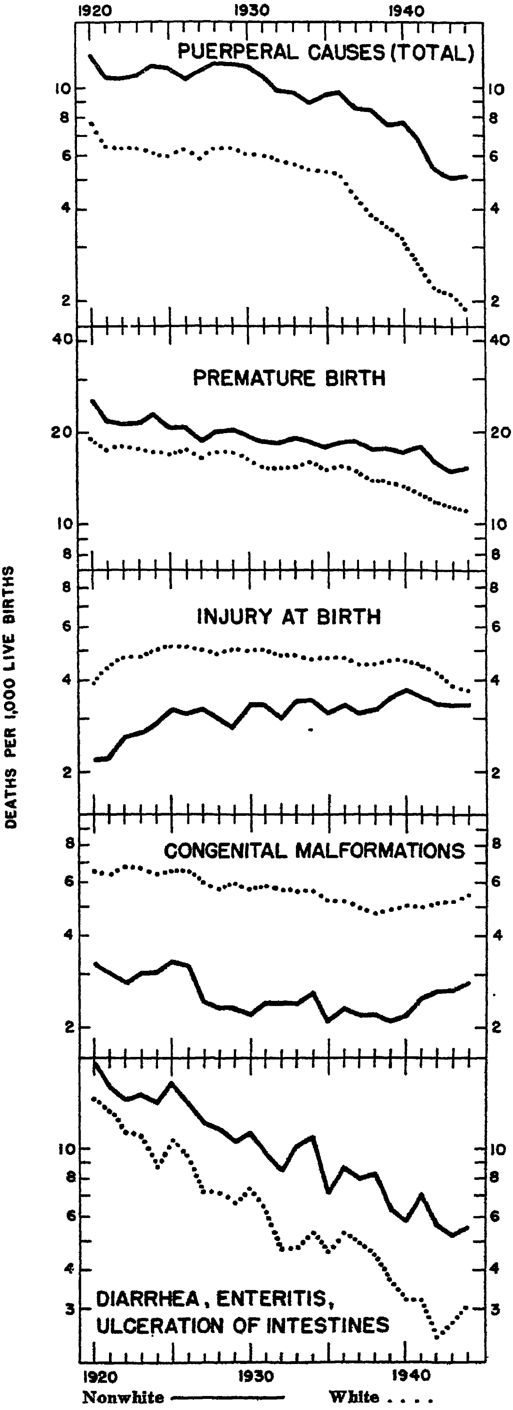
	Non-white	White
1930–40	−7.8	−5.4

Death rate per 100,000

Year	Non-white	White
1919–21	22.4	1.9
1929–31	13.8	1.6
1939–41	5.6	.6

Average annual percentage change

	Non-white	White
1930–40	−5.9	−6.3



Deaths per 1,000 live births

Year	Nonwhite	White
1919–21	12.0	7.0
1929–31	11.6	6.1
1939–41	7.4	3.1

Average annual percentage change

	Nonwhite	White
1930–40	−3.6	−4.9

Deaths per 1,000 live births

Year	Nonwhite	White
1919–21	24.3	18.4
1929–31	19.5	16.3
1939–41	17.6	13.2

Average annual percentage change

	Nonwhite	White
1930–40	−1.0	−1.9

Deaths per 1,000 live births

Year	Nonwhite	White
1919–21	2.2	3.9
1929–31	3.1	5.0
1939–41	3.6	4.5

Average annual percentage change

	Nonwhite	White
1930–40	+1.6	−1.0

Deaths per 1,000 live births

Year	Nonwhite	White
1919–21	3.1	6.5
1929–31	2.3	5.8
1939–41	2.3	5.0

Average annual percentage change

	Nonwhite	White
1930–40	0.0	−1.4

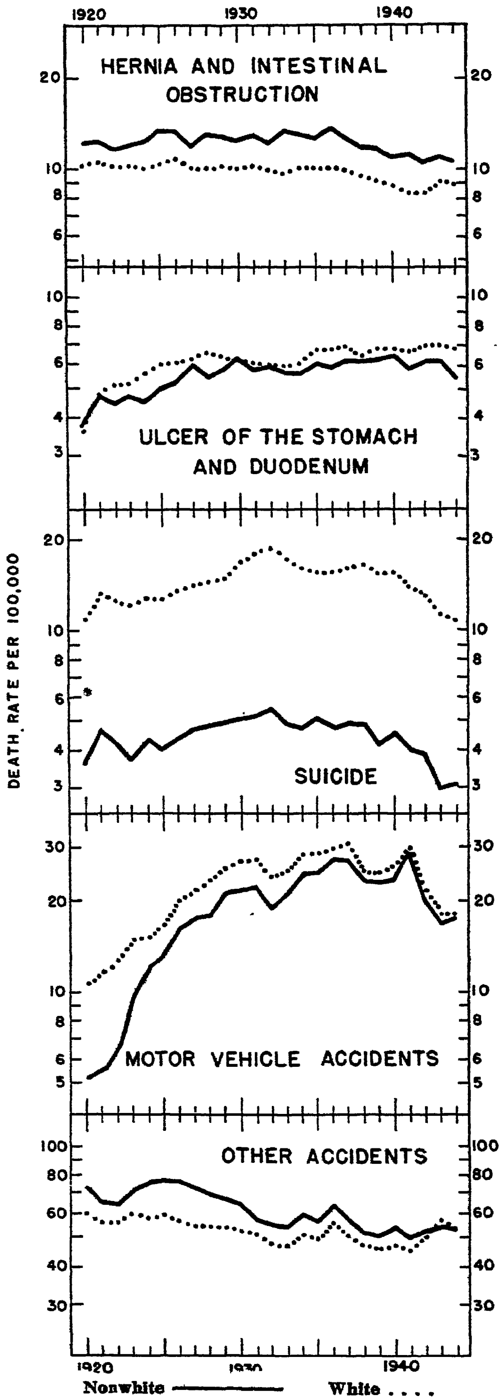
Deaths per 1,000 live births

Year	Nonwhite	White
1919–21	18.3	14.4
1929–31	10.6	6.8
1939–41	6.4	3.4

Average annual percentage change

	Nonwhite	White
1930–40	−4.0	−5.0

FIGURE 6.—Mortality from selected causes, deaths under 1 year of age, per 1,000 live births and maternal mortality—nonwhite and white mortality in the death registration States, 1920–1944.



Death rate per 100,000

Year	Non-white	White
1919–21	12.1	10.3
1929–31	12.7	10.1
1939–41	11.3	8.7

Average annual percentage change

	Non-white	White
1930–40	−1.1	−1.4

Death rate per 100,000

Year	Non-white	White
1919–21	4.1	4.0
1929–31	6.0	6.2
1939–41	6.2	6.8

Average annual percentage change

	Non-white	White
1930–40	+0.3	+1.0

Death rate per 100,000

Year	Non-white	White
1919–21	4.1	12.0
1929–31	5.0	16.6
1939–41	4.3	14.9

Average annual percentage change

	Non-white	White
1930–40	−1.4	−1.0

Death rate per 100,000

Year	Non-white	White
1919–21	5.2	10.8
1929–31	22.0	26.9
1939–41	25.3	27.1

Average annual percentage change

	Non-white	White
1930–40	+1.5	+0.1

Death rate per 100,000

Year	Non-white	White
1919–21	70.2	59.0
1929–31	62.4	52.3
1939–41	51.0	45.9

Average annual percentage change

	Non-white	White
1930–40	−1.8	−1.2

FIGURE 7.—Crude rates of mortality from selected causes—nonwhite and white mortality in the death registration States, 1920–1944.

Table 1.—*Mortality from selected causes, 1941–45*

Cause of death	Nonwhite					White				
	1941	1942	1943	1944	1945	1941	1942	1943	1944	1945
	Rate per 100,000 population									
All causes:										
Crude [1]	1,324.91	1,245.62	1,276.45	1,240.47	1,204.65	1,011.05	1,003.57	1,067.67	1,044.15	1,044.90
Age-adjusted [2]	1,549.28	1,452.34	1,479.83	1,413.50	1,357.96	972.46	948.58	988.84	941.69	930.80
	Crude rate per 100,000 population									
Selected causes:										
Diphtheria	1.65	1.22	0.96	1.03	1.39	0.89	0.91	0.89	0.84	1.19
Scarlet fever	.21	.21	.16	.17	.10	.35	.35	.36	.34	.24
Whooping cough	7.15	5.23	6.25	4.51	3.22	2.33	1.49	2.08	1.05	1.10
Tuberculosis (all forms)	122.09	116.46	112.86	106.23	102.59	35.23	34.26	34.35	33.68	32.71
Cancer and other malignant tumors	76.78	78.49	79.74	84.32	89.22	124.35	126.37	129.77	134.39	139.76
Cancer of digestive organs and peritoneum	30.46	31.59	31.92	34.34	35.88	57.33	58.34	60.09	61.71	63.69
Cancer of female genital organs [3]	36.65	36.22	36.58	37.69	37.19	31.11	30.49	31.17	31.42	31.35
Cancer of the breast [3]	13.76	13.65	14.16	13.78	15.36	23.99	24.40	24.44	24.56	25.60
Pneumonia (all forms)	82.50	78.88	88.30	79.64	73.79	43.72	43.57	50.46	45.01	40.58
Diseases of the heart	241.90	237.56	251.40	246.15	243.59	293.71	299.84	326.08	323.51	330.60
Intracranial lesions of vascular origin	108.15	107.63	111.93	110.35	113.27	86.28	87.51	93.05	91.79	96.00
Nephritis (all forms)	116.31	109.69	113.85	106.16	101.57	69.81	67.58	69.46	64.84	62.60
Syphilis (all forms)	47.49	42.47	42.14	39.56	37.11	9.27	8.60	8.64	7.94	7.53
Diabetes mellitus	16.25	16.68	17.95	19.18	17.51	26.34	26.23	28.17	27.21	27.71
Pellagra	5.03	3.77	3.39	2.45	1.86	.95	.81	.74	.58	.55
Malaria	4.65	3.31	2.49	2.16	1.49	.44	.33	.25	.24	.20
Hernia and intestinal obstruction	11.22	10.64	10.97	10.56	10.95	8.31	8.28	9.10	8.86	8.55
Ulcer of stomach or duodenum	5.86	6.14	6.21	5.41	5.71	6.71	6.96	7.06	6.75	6.91
Suicide	4.07	3.87	2.99	3.04	3.50	13.78	12.92	11.09	10.80	12.10
Motor-vehicle accidents	28.88	19.85	16.84	17.76	18.75	29.96	21.16	17.89	18.38	21.56
Other accidents	49.46	52.48	54.12	53.03	51.93	45.55	49.93	56.38	53.59	51.32
	Rate per 1,000 live births									
Puerperal causes (total)	6.78	5.44	5.10	5.06	4.55	2.66	2.22	2.11	1.89	1.72
Premature birth	17.90	15.97	14.98	15.34	14.85	12.62	11.81	11.36	11.37	11.09
Injury at birth	3.51	3.29	3.28	3.25	3.11	4.45	4.18	3.81	3.70	3.63
Congenital malformations	2.47	2.65	2.66	2.81	4.58	5.00	5.15	5.21	5.40	5.92
Diarrhea, enteritis, ulceration of intestines	7.07	5.59	5.17	5.55	4.97	3.19	2.42	2.70	3.00	2.75

[1] For crude death rates in the death registration States, 1900–1940, see reference (*2*).

[2] For age-adjusted death rates in the death registration States, 1900–1940, see reference (*3*). Death rates are adjusted to the total population as numerated in 1940.

[3] Per female population.

TABLE 2.—*Mortality from selected causes, adjusted for age, 1920–44* [1]

Year	Tuberculosis (all forms)		Cancer and other malignant tumors		Cancer of digestive organs and peritoneum [2]		Cancer of the breast [3]		Cancer of female genital organs		Pneumonia (all forms)		Diseases of the heart [4]		Intracranial lesions of vascular origin [5]		Nephritis (all forms) [6]		Syphilis (all forms) [7]	
	Nonwhite	White	Nonwhite	White	Nonwhite	White	Nonwhite	White	Nonwhite	White	Nonwhite	White	Nonwhite	White	Nonwhite	White	Nonwhite	White	Nonwhite	White
	Rate per 100,000 population, adjusted for age [8]																			
1920	273.7	104.9	72.8	106.5	(2)	(2)	16.6	19.1	47.6	29.0	204.8	136.2	245.8	199.8	146.3	120.8	173.1	108.2	43.5	15.8
1921	249.5	89.2	74.0	108.4	31.5	59.0	15.9	19.7	46.5	29.4	120.9	87.3	245.3	193.5	142.1	114.5	171.0	101.4	48.2	16.5
1922	228.2	87.0	73.8	109.0	31.2	59.0	16.1	19.3	45.9	29.3	144.5	101.4	241.5	204.1	147.0	116.9	172.7	104.7	50.3	16.4
1923	222.1	83.7	77.3	110.6	33.3	60.1	15.3	19.4	47.4	28.7	180.7	105.3	267.9	212.3	155.8	120.1	179.7	105.1	51.4	16.3
1924	227.7	78.8	80.5	111.9	34.3	60.3	16.9	20.1	49.5	28.9	184.4	92.1	202.1	210.7	170.6	119.6	201.9	101.0	54.9	15.8
1925	230.5	75.3	83.7	112.8	35.8	60.1	17.4	19.7	50.9	30.6	174.1	89.3	310.1	219.6	161.8	108.6	216.4	108.6	56.3	15.1
1926	233.0	75.6	86.2	114.9	37.8	60.6	16.8	20.9	50.2	30.7	187.6	98.6	320.8	234.8	168.1	109.3	216.1	110.5	58.7	14.7
1927	217.3	69.8	87.0	114.8	37.6	60.7	17.7	21.0	52.3	30.6	146.7	77.5	306.5	229.5	155.9	104.7	204.2	103.0	58.1	13.8
1928	207.6	68.1	83.1	115.2	35.0	60.0	17.0	20.8	48.0	30.9	169.8	95.0	320.9	242.2	168.3	107.5	212.1	105.2	59.0	13.3
1929	199.7	65.5	82.1	114.3	34.0	59.3	15.7	20.7	47.7	30.3	156.5	89.4	328.4	243.8	167.6	104.7	206.8	99.9	56.2	12.5
1930	199.7	60.5	82.8	115.3	35.1	59.1	16.5	21.7	47.8	30.5	149.1	80.7	337.1	244.8	170.4	101.0	212.1	98.3	59.7	12.4
1931	198.8	56.5	84.1	115.4	34.6	58.6	16.4	22.2	50.7	30.8	146.7	78.2	310.3	241.7	156.2	97.5	191.4	93.7	60.1	11.9
1932	180.5	52.0	85.9	117.5	35.4	59.4	17.8	22.5	50.2	31.2	130.5	74.4	298.2	251.9	152.9	96.7	174.4	93.5	59.7	11.8
1933	164.0	49.9	85.6	115.9	35.2	58.0	18.3	22.2	49.5	30.4	116.3	66.7	297.4	252.4	144.1	91.4	160.0	87.5	59.5	11.3
1934	154.8	47.3	88.8	118.6	37.1	58.7	17.6	23.1	50.5	31.1	140.8	75.4	315.1	261.1	149.6	90.8	170.4	86.7	64.3	11.6
1935	150.9	45.7	90.8	118.7	38.7	58.1	16.6	22.7	47.9	31.1	140.3	77.8	307.0	263.2	150.7	89.2	157.7	82.6	61.3	11.2
1936	157.7	45.5	90.4	120.5	37.7	58.4	16.9	23.0	48.2	31.5	169.2	86.9	335.8	280.4	158.7	92.9	166.0	82.8	64.5	11.6
1937	150.8	43.6	91.8	119.5	38.7	57.9	17.6	22.8	46.6	31.2	158.4	78.7	331.2	278.2	150.9	86.6	158.0	77.8	65.8	11.4
1938	142.3	39.1	96.1	120.1	39.7	57.6	17.5	23.2	50.0	30.6	127.0	61.9	327.3	274.2	149.8	83.9	151.9	73.9	66.1	11.0
1939	134.3	37.4	96.5	120.9	39.8	56.8	17.6	23.3	49.0	30.7	106.5	54.3	306.0	277.1	150.3	84.2	162.3	77.6	62.5	10.3
1940	133.1	36.1	101.7	121.2	41.8	56.1	18.6	23.6	49.3	30.5	99.7	49.9	330.3	288.1	151.3	85.6	166.5	74.2	61.6	9.7
1941	128.5	34.7	100.4	119.4	41.1	54.9	18.2	23.0	46.6	30.0	85.5	41.9	320.3	280.6	148.5	82.2	157.4	66.7	54.2	9.0
1942	123.4	33.5	102.2	119.3	42.4	54.8	17.6	23.1	46.3	29.1	80.0	41.1	316.5	281.2	145.5	81.8	146.7	63.4	48.5	8.2
1943	116.6	33.3	101.0	119.7	41.7	55.1	18.1	22.8	45.6	29.3	91.3	46.5	326.9	297.8	147.6	84.7	148.1	63.6	45.8	8.1
1944	109.7	32.7	106.9	124.0	44.8	56.6	18.0	23.2	47.0	29.6	82.3	41.5	320.2	295.5	145.6	83.5	138.1	59.3	43.1	7.4

---

[1] For crude death rates in the death registration States, 1900–1940 see reference (2).

For purposes of comparability, the Bureau of the Census has pointed out changes in classification, or has made transfers of deaths in some cases, which are fully described in the notes to the tables in the above reference. Some of these notes are included among the notes appended to this table.

Mexicans are included with the white in all populations. Deaths of Mexicans were recorded as colored in 1930–34; for 1930 and 1931 they have been tabulated and transferred to white deaths; for 1932–34 they were included with the nonwhite; in all other years deaths of Mexicans are tabulated as white deaths.

[2] Excludes cancer of the pancreas in 1920. [3] Per female population.

[4] Excludes disease of coronary arteries, 1920–29. See also footnote 6 to this table. [5] Includes all embolism and thrombosis, except puerperal, in 1920.

[6] Certain terms relating to combined cardiorenal conditions were transferred from diseases of the heart to nephritis in 1939 and following.

[7] Includes the total of "aneurysm (except of heart)" for 1921–38; includes only aneurysm of the aorta for 1939 and following.

[8] Death rates specific for cause and color for 1920–21, 1929–31, 1939–41, 1941, 1942, and 1943 were adjusted for age by the direct method to the total population of the United States as enumerated in 1940. That is, age specific rates were multiplied into a standard, the expected deaths summed, and divided by the total population of the standard. A ratio of adjusted to crude rate was computed for the same years and annual interpolations of the ratios were made between the ratios for successive decades (1920–30 and 1930–40). Annual rates adjusted for age were then obtained by multiplying the crude rate by the ratio of the adjusted to the crude. The adjusted rate for 1944 was obtained by multiplying the crude rate for 1944 by the ratio obtained for 1943.

Rates shown on the charts are averages of the crude annual rates as computed by the Bureau of the Census (2), and averages of the annual rates adjusted for age as described above.

Cancer (fig. 3), heart disease (fig. 4), and diabetes (fig. 5) are among the causes which have increased markedly in recent years. Cancer of the digestive organs and peritoneum has shown a marked increase in the rate among nonwhite. Heart disease has been increasing among white but shows no increase in the age-adjusted rates for nonwhite, in recent years.

Causes of death peculiar to early infancy are computed per 1,000 live births; among the causes shown (fig. 6) mortality from injury at birth has increased among the nonwhite; mortality in the first year of life from congenital malformations has increased since 1940 among both nonwhite and white. Maternal mortality and premature births have decreased more rapidly since 1935 among white than nonwhite.

Table 1 shows mortality rates (not adjusted for age) for the specific causes shown in figures 2–7 for the years 1941–45; rates for the years 1920–40 can be obtained from vital statistics rates in the United States 1900–40 (*2*). Table 2 shows mortality rates adjusted for age, as described earlier, for the causes of death shown in figures 3 and 4.

REFERENCES

(*1*) Gover, Mary: Negro Mortality. I. Mortality from all causes in the death registration States, Pub. Health Rep. **61**, 259–265 (1946). II. The birth rate and infant and maternal mortality, Pub. Health Rep. **61**, 1529–38 (1946).

(*2*) United States Bureau of the Census: Vital Statistics Rates in the United States, 1900–40 (1943).

(*3*) United States Bureau of the Census: Age-adjusted death rates in the United States, 1900–40: Iwao M. Moriyama. Vital Statistics—Special Reports, vol. 23, no. 1 (1945).

DEATHS DURING WEEK ENDED JANUARY 17, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Jan. 17, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	10,150	9,960
Median for 3 prior years	9,960	------
Total deaths, first 3 weeks of year	31,881	30,807
Deaths under 1 year of age	671	846
Median for 3 prior years	658	------
Deaths under 1 year of age, first 3 weeks of year	2,219	2,523
Data from industrial insurance companies:		
Policies in force	66,858,967	67,232,072
Number of death claims	14,551	14,888
Death claims per 1,000 policies in force, annual rate	11.4	11.5
Death claims per 1,000 policies, first 3 weeks of year, annual rate	9.5	9.4

Q FEVER STUDIES IN SOUTHERN CALIFORNIA

I. Recovery of *Rickettsia burneti* from raw milk [1] [2]

By R. J. Huebner, *Senior Assistant Surgeon,*[3] W. L. Jellison,[4] *Parisitologist,* M. D. Beck,[5] R. R. Parker,[4] *Director, and* C. C. Shepard,[3] *Surgeon*

A previous report (*1*) of observations made during the spring of 1947 on the occurrence of 17 cases of Q fever in Los Angeles County and subsequent studies (*2*) of 100 additional cases, indicated that Q fever is endemic [6] in Southern California. Proximity to dairies by reason of occupation or residence was a common factor in the histories of more than 50 percent of the cases. Except for dairy workers, it was noted that the infected persons rarely used milk from nearby dairies. It was also found in fairly extensive serological surveys that 10 to 20 percent of the dairy cows in the Los Angeles area possessed serum antibodies for Q fever.

These studies, when completed, will be reported later. The purpose of this paper is to report the recovery of *R. burneti,* the causative agent of Q fever, from the raw milk of four widely separated dairies in Los Angeles County.

METHODS OF STUDY

Epidemiological data pointed to certain dairies as being involved in recent human cases (dairy workers or nearby residents). Raw milk from suspected dairies was tested as being the possible source of infection. The cows were prepared for milking in the usual manner by washing the udder with water, but the udders of some were further washed with 70 percent alcohol before specimens were taken. Specimens from individual cows were hand milked into sterile wide-mouth vials which were sealed immediately after sampling all four quarters of the udder. In some instances the specimens represented strippings taken after milking machines had been used.

Specimens of pooled milk were obtained in three ways: (1) By pooling at the Q Fever Laboratory samples obtained by the above method, (2) by taking samples from milk cans by means of milk dippers, and (3) by similarly collecting samples of milk which had been mixed in the pasteurizing vat of a bottling plant.

The fresh raw milk specimens in 3 to 5 cc. amounts were promptly injected intraperitoneally or subcutaneously into adult guinea pigs at the Q Fever Laboratory, or were frozen with carbon dioxide and shipped to the National Institute of Health, Bethesda, Md., and the Rocky Mountain Laboratory of the National Institute of Health, Hamilton, Mont. At the Q Fever Laboratory, uninoculated control guinea pigs were kept in the same cages with milk-inoculated guinea pigs. One of each group of guinea pigs, showing elevated temperatures for 2 or 3 days, was sacrificed and the whole blood or spleen passed to other guinea pigs. All surviving guinea pigs, including the controls, were bled 30 to 35 days after inoculation, and the serums were tested by the complement fixation test[7] [8] for Q fever antibodies. The development of antibodies in the serums of guinea pigs was regarded as evidence that the material inoculated was infected. However, in those instances where a disease-producing agent appeared to have been recovered, passages in guinea pigs were continued, and where strains of rickettsiae appeared to be well established, cross-immunity tests were performed with known strains of Q fever rickettsiae. Blood, spleen, or other tissues of well-established strains were inoculated into mice and into the yolk sacs of fertile hen's eggs. Yolk sacs which showed infection with a rickettsia-like agent were prepared as antigens and tested by the complement fixation test with standard Q fever serums, human and bovine serums from California, and control serums.

---

[1] This work has been facilitated by the Q Fever Laboratory, which was established September 12, 1947, in the endemic area of Southern California, as a cooperative undertaking of the National Institute of Health, the California State Department of Public Health, and the Los Angeles County Health Department.

[2] From the Division of Infectious Diseases, NIH, Bethesda, Md.

[3] From NIH, U. S. Public Health Service, Bethesda, Md.

[4] From the Rocky Mountain Laboratory, U. S. Public Health Service.

[5] From the California State Department of Public Health.

[6] Cases have been recognized in Los Angeles, Ventura, Santa Barbara, and Orange Counties.

RESULTS

Rickettsial organisms, identified by all available criteria as *R. burneti*, were recovered by each of the three laboratories from the milk of four widely separated dairies located in Los Angeles County. A total of 50 milk specimens was injected into guinea pigs, 40 of them giving evidence of infection with *R. burneti*. Table 1 shows in some detail the isolation studies that have been completed on milk specimens from the four dairies as tested in two laboratories. Table 2 gives the results obtained in the third laboratory.

Dairy No. 1.—Approximately 12.5 percent of 1,050 cows from dairy No. 1 were found to possess antibodies for Q fever in the complement fixation test, and 28 cases of Q fever were found in persons living or working in close proximity to this dairy. The pooled milk of each of 33 milking strings[9] representing 28 to 30 cows was collected by methods described above.[10] The 33 milk specimens were promptly frozen and shipped by air express to the National Institute of Health where they were inoculated into guinea pigs.

---

[7] Both Bengtson and modified Kolmer techniques were used.

[8] Henzerling and Nine Mile strains were used as antigen.

[9] A group of cows milked together as a unit.

[10] The milk specimens were cultured on blood agar plates and ascertained to be free of pathogenic bacteria detectable by that technique. We are indebted to Dr. Charles W. Bonynge of the University of Southern California for these tests.

Table 1.—*Data on rickettsial agents recovered from raw milk of 4 dairies in the Los Angeles area as acquired by means of the complement fixation test, yolk sac cultivation and cross-immunity tests in the Q Fever Laboratory, Los Angeles County, and the National Institute of Health*

Source of raw milk	Results of complement fixation test for Q fever on serums of guinea pigs injected with milk at specified laboratories		Rickettsial trains cultivated in yolk sacs of fertile eggs (National Institute of Health)	Cross-immunity test with Dyer strain of *R. burneti* (National Institute of Health)
	Q Fever Laboratory	National Institute of Health		
Dairy No. 1:				
Pool No. 1 (5 cows)	x	x	...	...
Pool No. 2 (500 cows)	x	...	...	...
Pool No. 3 (500 cows)	x	...	...	...
Strings 28–30 cows each: [1]				
1	...	x	...	...
2	...	x	x	...
3	...	—	...	...
4	...	x	...	...
5	...	x	...	...
6	...	x	...	x
7	...	x	...	...
8	...	x	...	...
9	...	x	...	...
10	...	x	...	...
11	...	x	...	...
12	...	x	...	...
13	...	—	...	...
14	...	x	x	...
15	...	x	...	...
16	...	—	...	...
17	...	x	...	x
18	...	x	...	...
19	...	—[2]	x[2]	—
20	...	x	x	...
21	...	x		x
22	...	x	...	...
23	...	x	...	...
24	...	x	...	...
25	...	x	x	x
26	...	x	...	...
27	...	x	x	x
28	...	x	...	...
29	...	x	...	...
30	...	x	...	...
31	...	x	...	...
32	...	x	...	...
33	...	x	...	...
34	...	x	x	...
Individual cows with mastitis of unknown cause:				
5203	—	—	...	...
5708	—	—	...	...
5282	—	—	...	...
7111	—	—	...	...
Cows:				
7334	...	x	x	...
6832	...	x	x	...
Dairy No. 2:				
Pool No. 1 (15 cows)	x	...	...	...
Pool No. 2 (15 cows)	—	...	...	...
Individual cows:				
95	x	...	...	...
129	—	...	...	...
185	x	...	...	...
Dairy No. 3:				
Pool No. 1 (10 cows) (serologically positive)				
Dairy No. 4:				
Pool No. 1 (30 cows)				
Pool of entire herd (90 cows)				

Note:
x = Positive.
– = Negative.
[1] = Group of cows milked together as a unit.
[2] = A rickettsia-like organism immunologically distinct from Q fever.

After an average incubation period of 9.7 days (variation 5 to 17 days) 26 of these specimens produced febrile episodes in guinea pigs. Twenty-nine specimens produced serum antibodies for Q fever in the guinea pigs which were bled 30 days after inoculation. Seven of the milk specimens therefore failed to produce fever, but only 4 failed to produce Q fever antibodies.

Guinea pigs which became febrile following inoculation with 8 of the specimens were sacrificed, and illnesses typical of the reaction following injection with Q fever rickettsiae were produced in other guinea pigs inoculated with the blood or spleen of these animals. Gross pathological changes typical of this infection were observed in second passage guinea pigs, i. e., large friable spleens and subcutaneous indurated nonsuppurative inflammatory reactions. Attempts to culture an agent by ordinary bacteriological methods from the blood and spleen of infected guinea pigs were negative.

Eight strains of rickettsiae were established in the yolk sacs of fertile hen's eggs by the use of infected guinea pig blood and tissues. The cultural, morphological, and tinctorial characteristics of these strains could not be distinguished from known strains of *R. burneti.* Antigens prepared from infected yolk sacs reacted specifically in the complement fixation test with standard Q fever serums and positive human and cattle serums from California. Positive reactions were not obtained with normal serums nor with serums positive for other diseases.

Complete cross immunity in guinea pigs which had been inoculated with the Dyer strain of Q fever rickettsiae was demonstrated with five guinea-pig California adapted strains.

Specimens of milk from each of 86 cows from dairy No. 1 were also injected into guinea pigs at the National Institute of Health. Complete results are not available. However, 13 of the 86 specimens produced antibodies in guinea pigs and 2 strains (6,832 and 7,334) were readily cultured in the yolk sacs of fertile hen's eggs.

Another organism fulfilling the cultural and tinctorial requirements of a rickettsia when grown on the yolk sac of fertile eggs was recovered from the pooled milk of string 19 (table 1), 1 of the 4 strings from which *R. burneti* was not recovered. This organism produced early onset of fever, ecchymosis, and necrosis of the scrotum and frequently death when it was inoculated into male guinea pigs. It was found in cross immunity and complement fixation tests to be immunologically distinct from *R. burneti.* Attempts to grow this organism on cell-free media have failed. This organism as well as an apparently identical organism recovered from the feces of cows represented in milk pool No. 1 (table 1) will be studied further.

At the Q Fever Laboratory, samples from 3 pools of milk from dairy No. 1 were inoculated into guinea pigs. Each of 2 specimens represented pooled milk from half the cows of the dairy, approximately 500 cows each. Strains of Q fever rickettsiae were established in guinea pigs from each specimen. The third specimen represented the pooled milk of 5 cows which were serologically positive for Q fever. This specimen was divided and injected into guinea pigs at the National Institute of Health, as well as at the Q Fever Laboratory. Illnesses typical of Q fever and specific Q fever antibodies were produced in guinea pigs at both laboratories.

At the Rocky Mountain Laboratory, samples from 10 pools of milk representing 16 strings from dairy No. 1 were injected into guinea pigs. Nine recoveries of a rickettsial agent were made. One strain was cultivated in the yolk sacs of fertile hen's eggs and 9 strains were shown to produce immunity in guinea pigs to the Nine Mile strain of Q fever. These tests fully confirmed the results at the other 2 laboratories and indicated again that the recovered organisms were strains of *R. burneti* (table 2).

TABLE 2.—*Complement fixation and immunity test on guinea pigs injected at the Rocky Mountain Laboratory with milk specimens from dairy No. 1*

Strings[1] of dairy cows from which pooled milk specimens were injected into guinea pigs	Results of complement fixation tests for Q fever on serums of guinea pigs injected with milk	Strains cultivated in yolk sac	Immunity to Nine Mile strain of *R. burneti*
String No.:			
1	x		x
5	x		x
8			x
14			x
Pooled strings:			
12 and 24	x		x
15 and 26	x		–
21 and 22			x
23 and 26			x
28 and 30		x	x
19 and 33			x

[1] Pooled milk specimens taken from milking strings consisting of 28 to 30 cows identical with those listed in table 1.

NOTE.—x=Positive for Q fever.
–=Negative for Q fever.

Dairy No. 2.—A small dairy milking less than 100 cows was studied because a son of the dairy owner had recently contracted Q fever. Five specimens of milk were tested and results on 3 indicated infection with Q fever. One of the cows found to be shedding *R. burneti* was a young Guernsey, producing milk with a high butterfat content. No illness was apparent and the cow was regarded by the owner as one of his best producers.

Dairy No. 3.—Dairy No. 3, a dairy milking approximately 200 cows, was one of the dairies found during the preliminary studies in the spring of 1947 to have a number of serologically positive cows. One pool of milk representing 10 cows found to be positive by the complement fixation test was divided and injected into guinea pigs in both the Q Fever Laboratory and at the National Institute of Health. Organisms identical with *R. burneti* were recovered.

Dairy No. 4.—Approximately one-third of the cows on dairy No. 4 (90 cows) were found to be positive for Q fever in the complement fixation test. A pool of milk representing the entire herd was tested at the National Institute of Health and at the Q Fever Laboratory. All injected guinea pigs developed fever after a relatively short incubation period and were subsequently shown to have antibodies for Q fever. Another pool of milk representing one string of approximately 28 cows inoculated at the Q Fever Laboratory likewise resulted in the production of Q fever antibodies in the guinea pigs and the establishment of a strain.

The raw milk of a fifth dairy was also studied. A single specimen of milk pooled from the entire herd of 130 cows was obtained at a bottling plant. Whole milk, cream, and resuspended sediment (concentrated 10 times) were each injected into guinea pigs. Studies which were incomplete at the time of writing this report indicated that *R. burneti* was not recovered.

No perceptible evidence of illness was apparent in cows which were found to be shedding *R. burneti* in milk. This observation was supported by the observations of five or more well qualified veterinarians. Several cows with demonstrable mastitis were tested. In each instance both blood and milk from the cows gave negative results for Q fever when injected into guinea pigs (table 1, numbers 5203, 5708, 5282, 711, and 129).

TESTS OF MATERIALS OTHER THAN MILK

Cattle blood.—Injections of whole blood and blood clots from more than 150 cattle, most of them lactating cows (some serologically positive) from dairies where there were human cases of Q fever, have not resulted in the recovery of *R. burneti.* However, most of these specimens were shipped unfrozen to the National Institute of Health and preserved at icebox temperatures for as long as a month before they were inoculated.

Urine and feces.—A pool of urine and a pool of feces taken from the cows represented in pool No. 1 from dairy No. 1 (table 1) were inoculated into guinea pigs. Q fever rickettsiae were not recovered from these excretions despite the fact that organisms were recovered from milk taken from the same cows at the same time. Other specimens of urine and feces have been tested with negative results; however, more extensive studies with these excretions are planned.

Sick calves.—Four blood specimens and one spleen specimen from calves ill with fever and diarrhea of undetermined origin were tested. Inoculation experiments and serological tests of recovered calves indicated that these animals were not infected with Q fever organisms.

Insects and arthropods.—Pooled specimens of flies,[11] mosquitoes,[12] and several species of free living mites,[13] collected from alfalfa feed were injected into guinea pigs on a limited scale. Completely negative results were obtained. Spinose ear ticks [14] also were injected but tests are not yet complete.

VALIDITY OF RESULTS

Since the Q Fever Laboratory was located in an area in which this disease appeared to be highly endemic in both human and animal populations and since spontaneous infection of guinea pigs with this agent is known to occur in experimental laboratories (*3*), it was necessary to determine the likelihood of spontaneous infections in milk-inoculated guinea pigs. The results of the inoculation experiments and a serological check of 20 normal guinea pigs and a large pool of guinea-pig serums (complement) indicated that guinea pigs raised commercially in the area were free of Q fever infection.

Fifty guinea pigs inoculated with materials other than milk and 20 uninoculated guinea pigs which were kept in cages with inoculated animals at no time showed signs of illness suggestive of infection with Q fever rickettsiae. These animals when bled were without exception negative for Q fever by the complement fixation test. In contrast to these negative results, 9 recoveries of this organism were made from 15 specimens of milk inoculated during the same period.

At the National Institute of Health the milk specimens reported on in this paper represented the first inoculations of experimental material to be made in a newly constructed laboratory. No instance of spontaneous Q fever infection in guinea pigs has been encountered in this building to date.

The results obtained at the Rocky Mountain Laboratory were fully confirmatory of the results obtained in the other laboratories. Further evidence bearing on the validity of the results was provided by the fact that in seven instances where a pool of milk produced the infection in one laboratory, it was also found positive in another.

DISCUSSION

The relative ease with which *R. burneti* was recovered from milk of dairies in Los Angeles City and County suggests a high degree of availability of this pathogenic agent to the human and animal populations of the area, since nearly all of this milk is transported about the county before processing and much of it is sold raw. The occurrence of Q-fever infection in the human population and a demonstrable widely disseminated source of *R. burneti* in the same area suggest a causal relationship. Whether or not milk represents an effective source of infection to man, however, cannot be determined by the data presented in this report.

---

[11] *Siphona irritans* (L.) and *Musca domestica* L.

[12] *Culex quinquefasciatus* Say.

[13] *Gohiera fusca* Oudms and *Histiostoma* Sp.

[14] *Otobius megnini* (Duges).

NOTE.—Footnotes 12, 13, and 14 determined at U. S. National Museum.

The evidence presented by outbreaks in packing houses, stockyards, (*4*, *5*) and laboratories (*3*) did not indicate that the drinking of infected milk was a cause of those outbreaks. A pulmonary route of infection was considered the most likely possibility in several of these outbreaks. Incomplete studies in California (*1*, *2*) suggest that, for certain specific occupational and residential groups, the drinking of infected milk is an improbable mode of infection. However, the evidence did not rule out infected milk as a potential source of infection to man by some mode yet to be determined.

The failure to recover *R. burneti* from whole blood, blood clots, urine, and feces of a limited number of cows shedding *R. burneti* in their milk and the absence of a demonstrable illness in the infected animals suggested that a local infection of the udder may occur in the absence of concurrent severe systemic infection in the cow. The presence of *R. burneti* was not associated, however, with observable pathology in the udder or with diminution in either quantity or quality of milk.

SUMMARY

R. burneti, the causative agent for Q fever was recovered from the raw milk of four dairies in Southern California. These recoveries were made in three laboratories: The Q Fever Laboratory, Los Angeles County, Calif.; The National Institute of Health, Bethesda, Md.; and the Rocky Mountain Laboratory, Hamilton, Mont. Seven isolations were made from duplicate specimens studied in two of the three laboratories.

The isolation of *R. burneti* from milk was established on the basis of the following manifestations of the recovered strains:

1. Febrile episodes typical of Q fever were produced in guinea pigs, and gross pathological findings typical of infection with Q fever rickettsiae were observed.
2. Specific antibodies for Q fever were demonstrated in the serums of guinea pigs previously injected with milk. The failure of such antibodies to appear in a large group of uninoculated control guinea pigs and the guinea pigs injected with materials other than milk provided good evidence against the occurrence of spontaneous infection in the guinea pig colonies.
3. Cross-immunity tests performed at the National Institute of Health and at the Rocky Mountain Laboratory showed that five newly isolated strains were identical with the Dyer strain of *R. burneti* and nine strains were shown to produce immunity to the Nine Mile strain of *R. burneti.*
4. Rickettsia-like organisms were cultivated in the yolk sac of fertile hen's eggs from the blood and spleen of guinea pigs inoculated with milk. The cultural, morphological, and tinctorial characteristics of eight such strains were identical with those of *R. burneti.*

5. Yolk sac antigens prepared from milk strains by the usual techniques reacted specifically in the complement fixation test with standard Q fever serums.

6. Serums from California cows and humans found to contain antibodies for Q fever were tested with antigens prepared from milk strains. Specific reactions occurred in the complement fixation test.

While *R. burneti* was recovered from raw milk the available epidemiological evidence did not indicate that the drinking of milk was the cause of the majority of cases which have been studied thus far. However, that infected milk may serve as a source of infection to man by some mode as yet undetermined appeared to be a distinct possibility.

ADDENDUM

Tests,[15] as yet incomplete, indicate that the two methods of pasteurization in general use in two large commercial milk plants rendered the raw milk naturally infected with *R. burneti* apparently noninfectious for guinea pigs. Three tests using the vat method and four tests using the high-temperature short-time method of pasteurization have been completed. A fourth experiment with vat pasteurization was incomplete at the time of preparation of this manuscript.

ACKNOWLEDGMENTS

This work could not have been accomplished without the assistance of Dr. W. L. Halverson, Director, California State Department of Public Health, and his staff, especially members of the Bureau of Vector Control; Dr. Roy Gilbert, Los Angeles County Health Department, and his staff, especially Dr. F. Wilcox and Dr. R. V. Stone; Dr. George Uhl, Los Angeles City Health Department, and his staff, and Dr. C. W. Bonynge, University of Southern California, and to Medical Director Walter T. Harrison, Director of U. S. Public Health Service Dist. No. 5.

We are indebted to Dr. David L. Lackman for the serological testing of many specimens and to Lt. Col. Arthur Long, Surgeon General's Office, A. U. S., for laboratory assistance in the portion of this work performed at the National Institute of Health.

REFERENCES

(*1*) Shepard, C. C., and Huebner, R. J.: Q fever in Los Angeles County. Description of some of its epidemiological features. Am. J. Pub. Health (to be published).

(*2*) Huebner, R. J., Jellison, W. L., and Beck, M. D.: Unpublished data.

(*3*) Huebner, Robert J.: Report of an outbreak of Q fever at the National Institute of Health. II. Epidemiological Features. Am. J. Pub. Health, **37**: 431–440. (April 1947.)

(*4*) Topping, N. H., Shepard, C. C., and Irons, J. V.: Q Fever in the United States. I. Epidemiological studies of an outbreak among stock handlers and slaughterhouse workers. J. A. M. A. **133**: 813–815. (March 1947.)

(*5*) Shepard, C. C.: An outbreak of Q fever in a Chicago packing house. Am. J. Hyg. **46**: 185–192. (Sept. 1947.)

---

[15] Report, Feb. 9, 1948, from the Q Fever Laboratory to the Director, California State Department of Public Health.

TWO NEW *SALMONELLA* TYPES: *SALMONELLA HIDALGO* AND *SALMONELLA MISSION* [1]

By James Watt, *Surgeon*, and Thelma M. DeCapito, *Assistant Bacteriologist, United States Public Health Service*, P. R. Edwards and Alice B. Moran, *National Salmonella Center* [1]

Two new *Salmonella* types have been isolated in the course of diarrheal disease studies in Hidalgo County, Texas.

A. Organisms of the *Salmonella* group are known to infect a large number of animals. In the present investigation of the epidemiology of salmonellosis in humans, routine cultures are being made on a series of domestic animals in the study areas. The organism described below as *Salmonella hidalgo* was isolated from a duck that was examined as a part of this work.

The specimens are collected by inserting a cotton-tipped applicator into the rectum or cloaca of the animal or fowl being studied. The entire swab is then placed in a tube of tetrathionate broth (Difco) which is incubated for 20–24 hours and then plated on SS agar (Difco). Suspicious colonies are fished to Kligler's iron agar and then identified in the routine manner. Specimens from a dog, a cow, and three ducks were cultured at the home involved. The cultures from the dog, cow, and one duck were negative. The culture from the second duck was positive for *Salmonella anatum*, and *Salmonella hidalgo* was isolated from the third duck culture.

The complete description of the organism follows: *S. hidalgo* possessed the cultural and biochemical characteristics generally attributed to the *Salmonella* group, except that it produced a slight acidity in salicin broth after 33 days' incubation. Hydrogen sulfide was produced, but indol was not formed nor was gelatin liquefied. Acid and gas were produced from glucose, arabinose, maltose, trehalose, rhamnose, xylose, dulcitol, sorbitol, and mannitol within 24 hours. Cellobiose was fermented after 5 days. Lactose, sucrose, raffinose, and inositol were not attacked. Jordan's tartrate was acidified.

On serological examination the organism was strongly agglutinated by *S. newport* O serum (VI, VIII) and in absorption tests removed all agglutinins from that serum. Examination of the H antigens revealed that the organism was diphasic. Phase 1 was agglutinated to the titer of *S. rubislaw* phase 1 serum (r) and completely removed H agglutinins from the serum in absorption tests. Phase 2 was agglutinated strongly by *S. abortus-equi* serum (enx) and by *S. glostrup*, phase 2 serum (enz$_{15}$). Absorption tests showed that phase 2 of *S. hidalgo* was identical with phase 2 of *S. glostrup*. The antigenic formula of *S. hidalgo* is VI, VIII : r-enz$_{15}$.

---

[1] From the Division of Infectious Diseases, National Institute of Health, Pharr, Texas, and the Department of Animal Pathology, Kentucky Agricultural Experiment Station, Lexington, Kentucky. The work reported here was done in part in connection with a project of the Kentucky Agricultural Experiment Station and is published by permission of the Director. This portion of the work was supported by a research grant from the United States Public Health Service

B. A previous communication described a new *Salmonella* type (1) isolated from humans in Hidalgo County, Texas. *Salmonella mission*, another new type was isolated in October 1946 in a continuation of these studies.

This organism was isolated from an SS agar plate prepared by streaking with a rectal swab. The organism was not recovered from tetrathionate broth in which the swab was incubated.

The patient was an 18-month-old Spanish-American male. The child had not had any diarrheal or other disease during the 6 months he had been followed prior to October 14, 1946, nor did he develop any illness during the next 6 weeks. Cultures were made in April, May, June, July, and August, 1946, and no *Salmonellas* were isolated from any of these cultures. No culture was made in September as the child was in Mexico from September 14 to 25. Again, in November cultures were made, and no *Salmonellas* were isolated. A specimen from a 5-year-old sibling was obtained at the same time and was found to be negative.

A description of the organism follows: The biochemical properties of *S. mission* were the same as those given for *S. hidalgo* except that it did not ferment salicin and that gelatin was liquefied after 65 days incubation.

S. mission was agglutinated strongly by *S. oranienburg* O serum (VI, VII) and in absorption tests removed all agglutinins from the serum. The culture was diphasic and phase 1 was agglutinated to the titer of *S. typhi* H serum (d). In absorptions it reduced the titer of *S. typhi* serum from 1–10,000 to 1–200. It completely removed agglutinins for phase 1 of *S. oregon*, *S. muenchen*, and *S. stanley* from the serum. Phase 2 was agglutinated by serums for all the nonspecific phases of the Kauffmann-White classification. When tested with absorbed serums for factors 2, 3, 5, 6, 7, 10, and 11 it was agglutinated only by factor 5 serum. In absorption tests it was found that phase 2 of *S. mission* was not identical with phase 2 of *S. thompson*. Lack of uniformity in the 1–5 phases long has been recognized.

The diagnostic formula for *S. mission* is VI, VII : d–1, 5.

A second strain of *S. mission* was isolated from a rectal swab culture of a cat in April 1947. This specimen, cultured in the manner described in A above, was obtained in a town 15 miles from the original source.

REFERENCE

(*1*) Watt J.; DeCapito T.; and Moran, A. B.: A new *Salmonella* type isolated from man: *Salmonella texas*. Pub. Health Rep., **62**: 808–809 (May 30, 1947).

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JANUARY 24, 1948

Summary

A slight increase in the incidence of influenza was reported, from 10,360 cases to 11,687 for the current week, as compared with 4,129 for the corresponding week last year and a 5-year (1943–47) median of 4,387. Of the current total, 10,696 cases (92 percent) occurred in 8 South Atlantic, South Central, Mountain, and Pacific States, as follows (last week's figures in parentheses): Virginia 949 (868), South Carolina 1,218 (880), Tennessee 233 (110), Alabama 344 (265), Arkansas 586 (439), Texas 5,027 (4,509), Arizona 1,274 (1,039), California 1,065 (1,023). Only 3 other States reported more than 76 cases—Wisconsin 108 (last week 51), West Virginia 139 (last week 159), and Oklahoma 161 (last week 442). The cumulative total for the first 3 weeks of the year is 32,382, as compared with 12,522 and 239,498, respectively, for the same periods of 1947 and 1944, and a 5-year median of 12,712.

Of 46 cases of poliomyelitis reported for the week (last week 40, same week last year 69, 5-year median 27), Idaho reported 10, New York 5, and North Carolina 4. For the first 3 weeks of the year 127 cases have been reported, as compared with 239 for the corresponding period last year and a 5-year median of 111.

One case of smallpox was reported, in Louisiana. Massachusetts and Pennsylvania each reported 1 case of anthrax. Totals reported for the first 3 weeks of the year for certain other diseases (corresponding week last year and 5-year medians in parentheses) are as follows: Diphtheria 729 (988, 1,014); the dysenteries, combined, 2,271 (1,834, 1,610); infectious encephalitis 14 (20, 22), measles 23,405 (10,949, 13,573); meningococcus meningitis 263 (266, 711); scarlet fever 6,330 (6,844, 10,749); smallpox 9 (13, 30); tularemia 74 (154, 87); typhoid and paratyphoid fever 111 (127, 132); endemic typhus fever 56 (155, 191), whooping cough 7,321 (6,582, 6,526).

Deaths recorded during the week in 93 large cities of the United States totaled 10,244, as compared with 10,150 last week, 9,958 and 10,157, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 9,958. The total for the 4 weeks ended January 24 is 42,125, as compared with 40,765 for the same period in 1947. Infant deaths during the week totaled 722, as compared with 671 last week, and a 3-year median of 622. The cumulative figure is 2,940, as compared with 3,378 same period last year.

Telegraphic morbidity reports from State health officers for the week ended Jan. 24, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47
	Jan. 24, 1948	Jan. 18, 1947		Jan. 24, 1948	Jan. 18, 1947		Jan. 24, 1948	Jan. 18, 1947		Jan. 24, 1948	Jan. 18, 1947	
NEW ENGLAND												
Maine	1	2	1	1	3	3	3	190	29	1	0	2
New Hampshire	0	0	0	1	2	-------	2	-------	6	0	0	0
Vermont	0	0	0	-------	42	42	2	179	28	1	0	0
Massachusetts	5	10	5	-------	-------	-------	388	431	409	2	4	8
Rhode Island	0	0	0	-------	-------	-------	-------	44	17	1	0	1
Connecticut	0	0	2	4	2	8	16	215	65	2	2	2
MIDDLE ATLANTIC												
New York	11	21	18	[1] 2	[1] 13	[1] 15	557	209	573	5	11	27
New Jersey	13	9	5	2	5	18	543	85	85	1	6	8
Pennsylvania	11	13	10	([2])	[2] 4	[2] 4	391	640	656	6	3	12
EAST NORTH CENTRAL												
Ohio	10	9	9	12	7	18	560	330	82	4	2	9
Indiana	10	5	5	13	3	16	249	24	61	1	1	7
Illinois	6	0	4	1	2	11	1,483	35	177	3	2	13
Michigan [3]	12	15	15	8	1	4	719	46	129	1	0	5
Wisconsin	5	3	3	108	46	101	275	71	71	3	3	8
WEST NORTH CENTRAL												
Minnesota	2	6	6	-------	-------	-------	385	30	16	0	2	3
Iowa	2	0	3	1	1	1	312	10	95	5	4	1
Missouri	8	1	4	15	4	12	39	2	45	0	4	9
North Dakota	0	0	1	1	34	34	93	1	2	1	0	1
South Dakota	0	0	0	-------	-------	-------	20	16	33	1	0	0
Nebraska	2	0	1	40	13	51	7	14	13	1	1	2
Kansas	3	14	3	76	67	67	9	9	130	1	0	5
SOUTH ATLANTIC												
Delaware	0	0	0	-------	-------	-------	61	2	4	2	0	0
Maryland [3]	6	15	12	3	5	26	30	158	33	3	2	4
District of Columbia	0	0	0	-------	-------	3	63	21	17	0	0	2
Virginia	4	10	10	949	596	763	136	67	116	2	1	11
West Virginia	10	6	4	139	51	51	244	-------	18	0	2	3
North Carolina	17	7	12	-------	-------	-------	2	169	59	3	0	7
South Carolina	15	1	6	1,218	713	775	24	46	46	1	1	1
Georgia	7	9	7	62	14	66	27	150	41	0	0	3
Florida	8	6	7	18	20	13	44	7	21	0	4	4
EAST SOUTH CENTRAL												
Kentucky	5	13	6	5	2	16	11	2	25	1	1	5
Tennessee	5	6	6	233	39	78	98	35	48	1	1	6
Alabama	5	5	6	344	50	175	7	8	11	2	2	4
Mississippi [3]	2	5	5	48	-------	-------	30	-------	-------	0	1	3
WEST SOUTH CENTRAL												
Arkansas	2	9	10	586	105	148	85	58	52	0	4	4
Louisiana	4	6	6	7	35	35	267	3	11	0	0	5
Oklahoma	11	0	5	161	114	126	6	6	19	1	0	3
Texas	19	26	44	5,027	1,788	2,094	778	71	111	12	6	10
MOUNTAIN												
Montana	3	0	1	31	9	35	97	135	54	2	0	0
Idaho	1	0	0	32	30	30	10	7	7	0	0	1
Wyoming	0	2	0	-------	6	6	122	7	10	0	1	1
Colorado	6	6	4	50	15	57	69	25	109	0	0	0
New Mexico	6	1	3	6	1	6	3	13	10	0	0	0
Arizona	4	4	4	1,274	259	259	12	43	14	0	0	0
Utah [3]	0	0	0	55	5	7	11	8	32	0	1	2
Nevada	0	0	0	-------	-------	-------	-------	-------	1	0	0	0
PACIFIC												
Washington	2	11	8	31	-------	1	102	19	140	3	0	2
Oregon	2	4	4	58	14	33	33	25	71	0	2	4
California	7	22	22	1,065	9	59	372	73	273	13	9	20
Total	252	282	312	11,687	4,129	4,387	8,797	3,739	5,490	86	83	240
3 weeks	729	988	1,014	32,382	12,522	12,712	23,405	10,949	13,573	263	266	711
Seasonal low week [4]	(27th) July 5-11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13-19		
Total since low	7,087	8,554	9,463	75,940	45,497	45,497	58,351	33,836	39,697	1,045	1,238	2,197

[1] New York City only.

[2] Philadelphia only.

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended Jan. 24, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended— Jan. 24, 1948	Week ended— Jan. 18, 1947	Median 1943–47	Week ended Jan. 24, 1948	Week ended Jan. 18, 1947	Median 1943–47	Week ended— Jan. 24, 1948	Week ended— Jan. 18, 1947	Median 1943–47	Week ended— Jan. 24,[5] 1948	Week ended— Jan. 18, 1947	Median 1943–47
NEW ENGLAND												
Maine	0	0	0	13	35	35	0	0	0	0	0	0
New Hampshire	0	0	0	2	8	8	0	0	0	0	0	0
Vermont	0	1	1	17	7	7	0	0	0	0	1	0
Massachusetts	1	0	0	86	172	287	0	0	0	2	4	1
Rhode Island	0	0	0	5	14	14	0	0	0	0	0	0
Connecticut	0	0	0	34	59	63	0	0	0	0	1	1
MIDDLE ATLANTIC												
New York	5	4	4	244	290	372	0	0	0	2	6	2
New Jersey	2	1	1	102	104	107	0	0	0	0	1	1
Pennsylvania	1	2	0	184	147	285	0	0	0	3	1	3
EAST NORTH CENTRAL												
Ohio	1	1	0	287	287	287	0	1	1	0	1	1
Indiana	1	0	1	49	83	100	0	2	2	0	0	1
Illinois	1	5	1	152	126	221	0	0	0	0	0	1
Michigan [3]	0	5	0	171	133	145	0	0	0	1	1	1
Wisconsin	0	0	0	66	95	175	0	0	0	0	1	0
WEST NORTH CENTRAL												
Minnesota	0	2	0	47	40	75	0	0	0	0	0	0
Iowa	3	1	0	63	33	49	0	0	0	0	0	1
Missouri	0	1	1	41	38	82	0	1	0	1	2	1
North Dakota	0	1	0	9	6	11	0	0	0	0	1	0
South Dakota	0	0	0	9	4	15	0	1	0	1	0	0
Nebraska	0	1	1	23	32	49	0	0	0	0	2	0
Kansas	0	3	0	30	77	77	0	0	0	1	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	9	25	12	0	0	0	0	0	0
Maryland [3]	0	1	0	33	48	56	0	0	0	1	1	1
District of Columbia	0	0	0	11	12	28	0	0	0	0	0	0
Virginia	0	0	0	28	44	48	0	0	0	2	1	1
West Virginia	0	2	0	29	23	35	0	0	0	0	0	0
North Carolina	4	0	0	36	36	51	0	0	0	1	0	0
South Carolina	1	0	0	6	3	7	0	0	0	1	0	0
Georgia	0	0	0	15	18	18	0	0	0	1	0	2
Florida	0	2	0	16	8	8	0	0	0	3	1	1
EAST SOUTH CENTRAL												
Kentucky	0	0	0	24	44	50	0	0	0	0	0	1
Tennessee	0	3	1	44	30	62	0	0	0	1	2	1
Alabama	2	0	0	25	8	16	0	0	0	0	1	0
Mississippi [3]	0	4	1	5	8	13	0	0	1	0	2	1
WEST SOUTH CENTRAL												
Arkansas	1	1	1	4	4	6	0	0	0	0	0	0
Louisiana	1	0	0	6	5	11	1	0	0	0	4	4
Oklahoma	2	1	0	22	1	25	0	0	0	1	1	1
Texas	0	2	3	36	40	103	0	0	0	8	5	5
MOUNTAIN												
Montana	0	1	0	23	11	14	0	0	0	0	1	1
Idaho	10	1	0	8	13	14	0	0	0	1	0	0
Wyoming	0	0	0	7	6	6	0	0	0	0	0	0
Colorado	0	0	0	22	53	53	0	0	0	0	0	1
New Mexico	0	0	0	3	7	10	0	0	0	0	0	1
Arizona	0	0	0	11	14	11	0	0	0	1	0	2
Utah [3]	1	1	1	36	28	45	0	0	0	0	0	0
Nevada	1	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	3	1	2	57	30	57	0	0	0	0	0	0
Oregon	3	0	0	34	13	24	0	0	0	0	0	0
California	2	21	3	81	106	206	0	0	0	8	5	2
Total	46	69	27	2,265	2,428	3,655	1	5	13	40	46	51
3 weeks	127	239	111	6,353	6,844	10,749	9	13	30	111	127	132
Seasonal low week [4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	10,338	25,036	13,499	28,892	33,530	49,070	30	67	113	3,520	3,655	4,708

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately as follows: Massachusetts 2 (salmonella infection); Georgia 1; Tennessee 1; Arizona 1; California 1.

Telegraphic morbidity reports from State health officers for the week ended Jan. 24, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended January 24, 1948							
	Week ended—		Median 1943–47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Jan. 24, 1948	Jan. 18, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	38	14	16	-----	-----	-----	-----	-----	-----	-----	1
New Hampshire	2	1	2	-----	-----	-----	-----	-----	-----	-----	-----
Vermont	132	30	34	-----	-----	-----	-----	-----	-----	-----	-----
Massachusetts	115	226	111	-----	2	-----	-----	-----	-----	-----	-----
Rhode Island	5	45	27	-----	1	-----	-----	-----	-----	-----	1
Connecticut	28	59	47	-----	-----	-----	-----	-----	-----	-----	1
MIDDLE ATLANTIC											
New York	129	251	251	12	10	-----	-----	-----	-----	-----	15
New Jersey	88	139	139	8	-----	-----	-----	-----	-----	-----	-----
Pennsylvania	84	225	220	-----	1	-----	1	-----	-----	-----	1
EAST NORTH CENTRAL											
Ohio	151	101	101	-----	-----	-----	-----	-----	-----	-----	1
Indiana	30	36	16	-----	-----	-----	-----	-----	-----	-----	-----
Illinois	70	133	100	5	2	-----	-----	-----	1	-----	13
Michigan [3]	139	219	129	1	1	-----	-----	-----	-----	-----	9
Wisconsin	122	135	98	-----	-----	-----	-----	-----	1	-----	6
WEST NORTH CENTRAL											
Minnesota	44	9	35	-----	-----	1	-----	-----	-----	-----	3
Iowa	5	7	10	2	-----	-----	-----	-----	-----	-----	16
Missouri	30	17	6	-----	-----	-----	-----	-----	-----	-----	3
North Dakota	26	-----	-----	-----	-----	2	1	-----	-----	-----	-----
South Dakota	2	3	2	-----	-----	-----	-----	-----	-----	-----	-----
Nebraska	10	2	5	1	-----	-----	-----	-----	-----	-----	1
Kansas	73	19	26	-----	-----	-----	1	-----	-----	-----	-----
SOUTH ATLANTIC											
Delaware	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Maryland [3]	41	96	60	-----	-----	5	-----	-----	2	-----	1
District of Columbia	5	1	6	-----	-----	-----	-----	-----	-----	-----	-----
Virginia	51	39	70	1	-----	51	-----	-----	1	1	2
West Virginia	13	-----	29	-----	-----	-----	-----	-----	-----	-----	-----
North Carolina	59	23	119	-----	-----	-----	-----	-----	-----	2	-----
South Carolina	158	39	53	3	2	-----	-----	-----	-----	-----	-----
Georgia	12	7	7	1	2	-----	-----	-----	1	3	3
Florida	28	25	20	1	-----	-----	-----	-----	-----	6	-----
EAST SOUTH CENTRAL											
Kentucky	7	48	33	-----	-----	-----	-----	-----	-----	-----	-----
Tennessee	34	28	28	1	-----	1	1	-----	-----	-----	-----
Alabama	49	50	15	-----	-----	-----	-----	-----	-----	-----	3
Mississippi [3]	5	-----	-----	-----	1	-----	-----	-----	1	-----	-----
WEST SOUTH CENTRAL											
Arkansas	25	5	15	3	-----	-----	-----	-----	-----	-----	-----
Louisiana	10	7	3	1	-----	-----	-----	-----	1	-----	-----
Oklahoma	39	11	10	-----	-----	-----	-----	-----	-----	-----	-----
Texas	387	252	193	18	280	66	-----	-----	1	3	14
MOUNTAIN											
Montana	10	3	5	1	-----	-----	-----	-----	-----	-----	-----
Idaho	5	1	2	-----	-----	-----	-----	-----	-----	-----	-----
Wyoming	10	1	5	1	-----	-----	-----	-----	-----	-----	-----
Colorado	59	1	30	-----	-----	-----	-----	-----	-----	-----	3
New Mexico	12	3	11	-----	-----	-----	-----	-----	-----	-----	3
Arizona	35	20	19	-----	-----	21	-----	-----	1	-----	-----
Utah [3]	15	-----	14	-----	-----	-----	-----	-----	1	-----	1
Nevada	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----
PACIFIC											
Washington	78	32	32	-----	-----	-----	-----	-----	-----	-----	-----
Oregon	6	10	10	5	-----	-----	-----	-----	-----	-----	-----
California	97	112	123	2	4	-----	-----	-----	-----	-----	5
Total	2,576	2,485	2,418	67	306	147	4	0	11	15	106
Same week: 1947	2,485	-----	-----	22	344	67	8	0	60	56	97
Median, 1943–47	2,418	-----	-----	27	309	67	8	0	35	56	[6] 78
3 weeks: 1948	7,321	-----	-----	167	1,047	1,057	14	2	75	56	267
1947	6,582	-----	-----	77	1,093	664	20	1	154	155	250
Median, 1943–47	6,526	-----	-----	81	1,093	436	22	0	87	191	[6] 200

[3] Period ended earlier than Saturday.

[6] 3-year median, 1945–47.

Anthrax: Massachusetts 1, Pennsylvania 1.
Territory of Hawaii: Leprosy 1, paratyphoid fever 1, whooping cough 33.

WEEKLY REPORTS FROM CITIES [1]

City reports for week ended Jan. 17, 1948

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	------	0	1	0	0	0	0	12
New Hampshire:												
Concord	0	0	------	0	------	0	1	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	1	0	0	0	0	3
Massachusetts:												
Boston	4	0	------	1	99	0	23	0	29	0	0	17
Fall River	0	0	------	0	------	0	0	0	0	0	0	12
Springfield	0	0	------	0	------	0	0	0	4	0	0	4
Worcester	0	0	------	0	1	0	9	0	7	0	0	7
Rhode Island:												
Providence	0	0	------	0	------	0	2	0	5	0	0	6
Connecticut:												
Bridgeport	0	0	------	0	2	0	0	0	7	0	0	------
Hartford	0	0	------	0	------	0	4	0	3	0	0	1
New Haven	0	0	------	0	------	0	2	0	3	0	0	3
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0	------	0	------	1	5	0	7	0	0	12
New York	11	1	3	4	355	5	75	2	70	0	2	27
Rochester	0	0	------	0	2	0	3	1	12	0	0	7
Syracuse	0	0	------	0	11	0	0	0	10	0	0	11
New Jersey:												
Camden	0	0	------	0	------	0	0	0	0	0	0	------
Newark	0	0	1	2	16	0	1	0	14	0	0	4
Trenton	3	0	------	0	3	0	4	0	3	0	0	------
Pennsylvania:												
Philadelphia	3	0	4	2	57	1	37	0	48	0	1	31
Pittsburgh	0	0	------	1	1	0	5	0	9	0	0	15
Reading	0	0	------	0	1	0	4	0	8	0	0	6
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	1	1	13	0	11	0	18	0	0	4
Columbus	2	0	3	3	67	0	2	0	10	0	0	3
Indiana:												
Fort Wayne	0	0	------	0	2	0	2	0	5	0	0	------
Indianapolis	1	0	------	0	44	0	4	0	3	0	0	3
South Bend	0	0	------	0	------	0	0	0	0	0	0	1
Terre Haute	0	0	------	0	18	0	1	0	1	0	0	------
Illinois:												
Chicago	1	0	2	0	383	2	25	0	52	0	0	22
Michigan:												
Detroit	3	0	1	0	23	1	19	1	66	0	0	21
Flint	0	0	------	0	1	0	3	0	3	0	0	------
Grand Rapids	0	0	------	0	123	0	1	0	3	0	0	5
Wisconsin:												
Kenosha	0	0	------	0	16	0	0	0	0	0	0	1
Milwaukee	0	0	------	0	7	0	1	0	16	0	0	15
Racine	0	0	------	0	15	0	1	0	0	0	0	5
Superior	0	0	------	0	------	0	0	0	0	0	0	2
WEST NORTH CENTRAL												
Minnesota												
Duluth	0	0	------	0	2	0	1	0	3	0	0	11
Minneapolis	0	0	------	0	148	0	4	0	15	0	0	20
St. Paul	0	0	------	0	8	0	5	0	5	0	0	17
Missouri:												
Kansas City	0	0	2	0	3	2	1	0	3	0	0	9
St. Joseph	0	0	------	0	1	0	0	0	2	0	0	------
St. Louis	4	0	2	1	22	1	6	0	14	0	0	9

---

[1] In some instances the figures include nonresident cases.

City reports for week ended Jan. 17, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota												
Fargo	0	0	------	0	11	0	2	0	1	0	0	5
Nebraska:												
Omaha	0	0	------	0	3	0	4	0	5	0	0	3
Kansas:												
Topeka	0	0	------	0	------	0	0	0	3	0	0	6
Wichita	0	0	------	0	2	1	3	0	4	0	0	5
SOUTH ATLANTIC												
Delaware:												
Wilmington	1	0	------	0	3	0	3	0	1	0	0	------
Maryland:												
Baltimore	2	0	3	1	3	0	8	0	13	0	0	35
Cumberland	4	0	------	0	------	0	1	0	1	0	0	1
District of Columbia:												
Washington	0	0	1	1	49	2	9	0	10	0	0	11
Virginia:												
Lynchburg	0	0	------	0	------	0	3	0	5	0	0	4
Richmond	0	0	------	0	------	0	2	0	6	0	0	8
Roanoke	0	0	------	0	------	0	0	0	0	0	1	------
West Virginia:												
Charleston	0	0	------	0	9	0	6	0	0	0	0	------
Wheeling	0	0	------	0	1	0	3	0	2	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	0	2	0	0	0	0	------
Wilmington	1	0	------	0	------	0	1	0	0	0	0	------
Winston-Salem	0	0	------	0	------	0	4	0	0	0	0	1
South Carolina:												
Charleston	0	0	83	1	1	0	2	0	0	0	0	2
Georgia:												
Atlanta	0	0	22	1	------	0	9	0	3	0	0	------
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Savannah	0	0	5	0	1	0	2	0	2	0	0	3
Florida:												
Tampa	1	0	1	0	16	0	4	0	2	0	0	8
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	1	0	23	0	5	0	1	0	2	8
Nashville	0	0	------	0	1	0	7	0	4	0	0	------
Alabama:												
Birmingham	0	0	5	0	1	1	6	0	0	0	0	1
Mobile	0	0	11	0	------	0	2	0	1	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	4	0	------	0	1	0	1	0	0	1
Louisiana:												
New Orleans	1	0	3	2	3	0	7	1	2	0	0	8
Shreveport	0	0	------	0	------	0	6	0	0	0	0	------
Oklahoma:												
Oklahoma City	0	0	------	0	54	1	4	0	2	0	0	4
Texas:												
Dallas	1	0	1	1	------	0	6	0	4	0	3	4
Galveston	0	0	------	0	------	0	2	0	0	0	0	------
Houston	1	0	5	0	15	0	7	0	1	0	0	10
San Antonio	0	0	3	4	1	0	1	0	0	0	0	2
MOUNTAIN												
Montana:												
Billings	0	0	------	0	4	0	0	0	1	0	0	1
Great Falls	0	0	------	0	4	0	0	0	0	0	0	1
Helena	0	0	------	0	------	0	0	0	0	0	0	------
Missoula	0	0	------	0	------	0	0	0	0	0	0	1
Colorado:												
Denver	2	0	9	0	17	0	2	0	4	0	0	28
Pueblo	0	0	------	0	------	0	0	0	2	0	0	14
Utah:												
Salt Lake City	0	0	------	0	5	0	1	0	2	0	0	------

City reports for week ended Jan. 17, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	11	0	1	1	9	0	0	5
Spokane	0	0	------	0	1	0	1	1	1	0	0	------
Tacoma	0	0	------	0	45	0	0	0	0	0	0	------
California:												
Los Angeles	3	0	461	11	22	3	25	1	11	0	0	36
Sacramento	0	0	1	1	3	0	3	0	1	0	1	------
San Francisco	5	0	15	0	151	1	13	1	13	0	0	6
Total	56	1	653	38	1,904	22	432	9	576	0	10	543
Corresponding week, 1947[1]	102	------	84	16	894	------	449	------	558	0	4	747
Average, 1943–47[1]	75	------	1,065	[2] 49	[3] 1,874	------	[2] 491	------	970	0	9	600

[1] Exclusive of Oklahoma City.
[2] 3-year average, 1945–47.
[3] 5-year median, 1943–47.

Anthrax.—Cases: Philadelphia, 1.
Dysentery, amebic.—Cases: Philadelphia, 1; Atlanta, 1; New Orleans, 6; Los Angeles, 2; San Francisco, 1.
Dysentery, bacillary.—Cases: New York, 1; Memphis, 2; Los Angeles, 2.
Dysentery, unspecified.—Cases: Baltimore, 4; San Antonio, 1.
Leprosy.—Cases: Los Angeles 1.
Tularemia.—Cases: Baltimore, 1; Atlanta, 3; New Orleans, 2.
Typhus fever, endemic.—Cases: New York, 1; Kansas City, 3; Savannah, 1; Los Angeles, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (latest available estimated population, 33,633,900)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	10.5	0.0	0.0	2.6	267	0.0	112.4	0.0	152	0.0	0.0	170
Middle Atlantic	8.3	0.5	3.7	4.2	206	3.2	62.0	1.4	84	0.0	1.4	52
East North Central	4.8	0.0	4.8	2.7	487	2.1	47.9	0.7	121	0.0	0.0	56
West North Central	8.0	0.0	8.0	2.0	398	8.0	51.7	0.0	109	0.0	0.0	169
South Atlantic	14.8	0.0	188.8	6.6	136	3.3	96.9	0.0	74	0.0	1.6	120
East South Central	5.9	0.0	100.3	0.0	148	5.9	118.0	0.0	35	0.0	11.8	53
West South Central	7.6	0.0	40.6	17.8	185	2.5	86.4	2.5	25	0.0	7.6	61
Mountain	16.5	0.0	74.3	0.0	248	0.0	24.8	0.0	74	0.0	0.0	372
Pacific	12.7	0.0	754.4	19.0	368	6.3	68.0	6.3	55	0.0	1.6	74
Total	8.7	0.2	101.5	5.9	296	3.4	67.2	1.4	90	0.0	1.6	84

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended January 3, 1948.—During the week ended January 3, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox	-------	13	7	26	452	47	31	32	74	682
Diphtheria	-------	-------	1	6	-------	2	1	1	1	12
Dysentery:										
Amebic	-------	-------	-------	-------	1	-------	-------	-------	-------	1
Unspecified	-------	-------	-------	-------	-------	-------	-------	-------	1	1
Encephalitis, infectious	-------	-------	-------	-------	1	-------	2	-------	-------	3
German measles	-------	-------	-------	2	11	-------	-------	6	5	24
Influenza	-------	31	-------	-------	1	-------	-------	-------	6	38
Measles	-------	-------	-------	198	452	3	2	7	72	734
Meningitis, meningococcus	-------	-------	-------	-------	3	1	-------	1	-------	5
Mumps	-------	29	2	74	328	26	19	37	26	541
Poliomyelitis	-------	-------	-------	-------	-------	1	7	2	1	11
Scarlet fever	-------	2	3	16	98	3	-------	4	10	136
Tuberculosis (all forms)	-------	5	10	31	37	30	13	-------	58	184
Typhoid and paratyphoid fever	-------	-------	-------	1	1	-------	-------	1	-------	3
Undulant fever	-------	-------	-------	4	-------	-------	-------	2	-------	6
Venereal diseases:										
Gonorrhea	4	11	11	83	95	31	29	28	83	375
Syphilis	-------	9	6	39	49	4	3	2	23	135
Other forms	-------	-------	-------	-------	-------	-------	2	-------	-------	2
Whooping cough	-------	3	-------	20	20	18	2	18	17	98

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Smallpox

Iran.—For the week ended December 12, 1947, 38 cases of smallpox with 2 deaths were reported in Iran.

Siam (Thailand)—Bangkok.—For the period January 1–21, 1948, 24 cases of smallpox with no fatalities were reported in Bangkok, Siam.

Yellow Fever

Belgian Congo—Orientale Province—Uele District—Bondo.—Information dated January 16, 1948, stated that 1 fatal case of yellow fever was reported in Bondo, Uele District, Orientale Province, Belgian Congo.

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE
THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS
G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948
For sale by the Superintendent of Documents, United States Government Printing Office Washington 25, D. C.
Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 FEBRUARY 20, 1948 NUMBER 8

IN THIS ISSUE

Acute Watery Diarrhea Epidemic in Alabama

Financing Local Health Services

CONTENTS

Page
An epidemic of acute watery diarrhea in Alabama. John W. Smillie, Beatrice F. Howitt and George A. Denison 233
Plague infection in Dawson County, Texas 243
Deaths during week ended January 24, 1948 243
Federal-State-local relationships in the financing of local health services. Malcolm H. Merrill 244

INCIDENCE OF DISEASE

United States:
  Reports from States for week ended January 31, 1948, and comparison with former years 252
  Weekly reports from cities:
    City reports for week ended January 24, 1948 256
    Rates, by geographic divisions, for a group of selected cities 258
  Territories and possessions:
    Hawaii Territory—Plague (rodent) 258
    Virgin Islands of the United States—Notifiable diseases—October–December 1947 258
Foreign reports:
  Canada—Provinces—Communicable diseases—Week ended January 10, 1948 258
  Finland—Notifiable diseases—November 1947 259
  Japan—Notifiable diseases—4 weeks ended December 27, 1947, and accumulated totals for the year to date 259
  Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—
    Cholera 260
    Plague 260
    Smallpox 260
    Yellow fever 260

Public Health Reports

Vol. 63 • FEBRUARY 20, 1948 • *No. 8*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

AN EPIDEMIC OF ACUTE WATERY DIARRHEA IN ALABAMA[1]

By JOHN W. SMILLIE, *Assistant Surgeon, United States Public Health Service;* BEATRICE F. HOWITT, *Bacteriologist;* and GEORGE A. DENISON, M. D.[2]

INTRODUCTION

The diarrhea described here is similar to the entity variously called epidemic diarrhea, nausea and vomiting, intestinal influenza, etc. (*1*).

In October 1946 an epidemic of acute watery diarrhea was in progress in Jefferson County, Alabama (population, 1940 census, 459,930). The epidemic started early in September and by mid-October over 150 cases had been reported to the County Health Officer, with 4–5 new ones a day. Five stool examinations from acutely ill patients revealed no pathogenic bacteria. No common source for the diarrhea could be found. However, the manner of spread suggested the possibility of a virus etiology.

On October 21, 1946, Dr. B. F. Austin, State Health Officer of Alabama, requested the assistance of the United States Public Health Service. Conferences were held with State authorities on that day and work was begun next day in Jefferson County.

Cases were being reported from Pinson with scattered cases from all sections of Jefferson County. Pinson is a village in Jefferson County, Alabama, 16 miles north of Birmingham in hilly, rural country. Though beyond the city limits, it is in the Birmingham Metropolitan Area (Census Bureau). Except for the few tradespeople in the block-long business district, most residents earn their living in Birmingham. Within a half-mile radius there are no more than 400 people. Except for one colored family, the population is entirely white. Pinson is unincorporated and has no local government. There are two physicians and they were most cooperative and helpful.

Specimens were taken from six acutely ill patients and shipped to the Public Health Service's Virus Laboratory in Montgomery, Alabama, where all virus laboratory work was carried on. During the last 2 weeks in October 1946 and during two subsequent visits, forty-seven contiguous families (172 people) were studied in Pinson. Acute cases in other families, both in Pinson and nearby localities, were also studied. Subsequent specimens, packed in dry ice, were sent to the Virus Laboratory from Pinson by air express.

---

[1] From the Communicable Disease Center, States Relations Division, U. S. Public Health Service, Atlanta, Ga., and the Jefferson County, Ala., Health Department.

[2] Health Officer, Jefferson County, Ala.

CLINICAL DESCRIPTION

The first step was to visit 13 persons; 10 who had diarrhea and 3 who had recovered within 3 weeks. These people gave a similar story: a sudden onset of watery diarrhea which lasted for several days. In 69 cases the illness ranged from 1 to 14 days with a median of 5 days and mean of 5.1 days (table 1).

TABLE 1.—*Distribution of 69 cases of acute watery diarrhea according to duration of illness, Pinson, Ala., Sept. 1, 1946–Jan. 28, 1947*

Length of illness	Number of cases	Length of illness	Number of cases
1 day	3	8 days	3
2 days	5	9 days	0
3 days	13	10 days	0
4 days	7	11 days	0
5 days	15	12 days	0
6 days	7	13 days	0
7 days	13	14 days	3

The majority of cases were accompanied by nausea and vomiting the first 3-4 days. The nausea and vomiting frequently preceded the diarrhea a few hours. In all cases there was hyperperistalsis, borborygmus and flatus. The flatus had a most foul odor. Although the patients were usually prostrated, recovery within a week was the rule. A brief residual weakness was the only observed sequela.

In the 13 persons closely questioned, the first symptom was: nausea, 4; vomiting, 3; diarrhea, 3; abdominal pain, 1; headache, 1; and flatus and distention, 1. The second symptom was: diarrhea, 10; vomiting, 2; nausea, 1. Table 2 gives the distribution of symptoms of 13 cases according to degree experienced.

TABLE 2.—*Distribution of symptoms of 13 cases of acute watery diarrhea, according to degree, Pinson, Ala., October 1946*

Symptom	Degree			Total
	Slight	Moderate	Severe	
Diarrhea	0	9	4	13
Abdominal pain	0	3	0	3
Vomiting	3	6	0	9
Nausea	5	6	0	11
Refusing food	1	6	0	7
Thirst	6	2	0	8
Headache	7	1	0	8
Weakness	4	6	0	10
Fever	0	2	0	2

There was no history or findings of mucus or blood in the stools, nor history of straining. No history of irritability, convulsions, nor sore throats was obtained. The two fevers of 100° and 102° were in children, and lasted only a day or two. Patients stated they lost some weight which was quickly regained. Treatment was chiefly symptomatic. Paregoric and bismuth were most frequently used. Sulfasuccidine was also used in several cases. None of these seemed to alleviate or shorten the illness.

One patient was studied at the Jefferson Hillman Hospital. Physical examination was unremarkable. There appeared to be mild hemoconcentration (W. B. C. 11,600; R. B. C. 5.2 million; hemoglobin 16 grams). Proctoscopy was negative as were cultures and direct examination of feces. Recovery was uneventful.

INCIDENCE AND EPIDEMIC CURVE

Of 172 people surveyed, 69 had the disease between September 1, 1946, and January 28, 1947. (See table 3 and fig. 1.) Thus, one in 2.5 or 40 percent were ill. This high prevalence suggests universal exposure with a low degree of resistance. Even when pandemic, influenza attacks but 30 percent of the population on an average (*2*), or 10 percent less than were stricken here.

In this community there appeared to be an abrupt onset, with about the same number of cases during the first three 14-day periods.

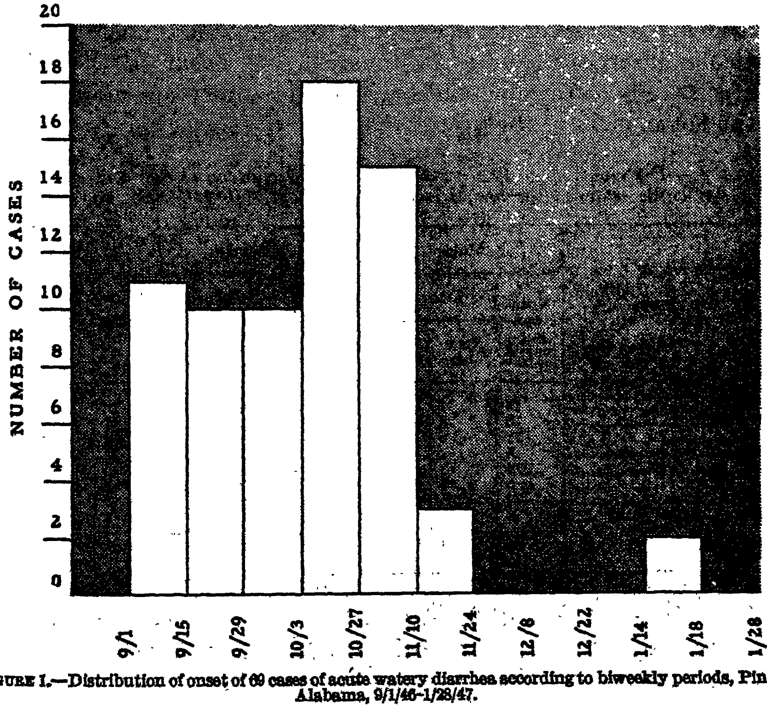


FIGURE 1.—Distribution of onset of 69 cases of acute watery diarrhea according to biweekly periods, Pinson, Alabama, 9/1/46–1/28/47.

A peak occurred in the fourth 14-day period, but was not markedly higher than for preceding periods. The epidemic practically disappeared during the sixth 14-day period. This is an unusual curve and is similar to that described by Reimann, Hodges, and Price (*1*). There was no history of any cases prior to September 1946. No one, including the two family physicians, remembered a similar epidemic.

TABLE 3.—*Distribution of onset of 69 cases of acute watery diarrhea according to biweekly periods, Pinson, Ala., Sept. 1, 1946–Jan. 28, 1947*

Date	Cases	Date	Cases
Sept. 1-14	11	Nov. 24-Dec. 7	0
Sept. 15-28	10	Dec. 8-21	0
Sept. 29-Oct. 12	10	Dec. 22-Jan. 3	0
Oct. 13-26	18	Jan. 4-17	2
Oct. 27-Nov. 9	15	Jan. 18-28	0
Nov. 10-23	3		

SECONDARY FACTORS

Age.—More men than women had diarrhea, but not significantly so statistically. (See table 4.) No age group escaped. There were four children under 1 year of age. One of these had diarrhea 1 day. An infant girl, born shortly after her mother and the two other members of the household had had the disease, did not become ill.

Race.—As only three colored persons live in Pinson, this factor cannot be appraised. One of the three negroes had the disease.

Season.—This epidemic occurred in the fall. It is characteristic of epidemic diarrhea, nausea and vomiting to occur in the fall and winter (*1*) (*3*). Amoebic and bacillary dysentery are more frequent in the hot months of the year.

TABLE 4.—*Distribution of 172 persons surveyed according to age and sex incidence of acute watery diarrhea, Pinson, Ala., Sept. 1, 1946–Jan. 28, 1947*

Age groups	Males			Females			Total		
	Number surveyed	Diarrhea		Number surveyed	Diarrhea		Surveyed	Number with diarrhea	Percent
		Number	Percent		Number	Percent			
00-09	19	7	37	17	5	29	36	12	33
10-19	18	8	44	13	3	23	31	11	35
20-29	12	6	50	12	6	50	24	12	50
30-39	8	3	38	15	5	33	23	8	35
40-49	18	13	72	12	4	33	30	17	57
50-59	6	2	33	7	1	14	13	3	21
60-69	5	3	60	5	2	40	10	5	50
70-over	3	1	33	2	0	00	5	1	20
Total	89	43	48	83	26	31	172	69	40

Nutrition.—Brief questioning suggested a satisfactory dietary. One third of the families had their own cow. There was no economic distress. Gardens and poultry yards were numerous.

Secondary cases.—There was at least 1 case in 31 of the 47 families studied. In 19 families there were secondary cases. The secondary attack rate is calculated as follows:

Total number of persons in 31 families	118
Number of primary cases	31
Number of persons exposed to infection by contact with these primary cases	87
Number of persons in these families subsequently developing diarrhea (secondary cases)	38
Secondary attack rate of susceptible persons (*e* =*d*/*c*) (percent)	43.7

Secondary cases accounted for 55.1 percent of the cases. Frost reports the secondary cases in diphtheria (from Chapin's records) to be about 40 percent of total cases (*4*).

Colds.—No acute upper respiratory infection occurred while persons were having the diarrhea. Colds appeared early in November after the diarrhea epidemic was almost over. They appeared to be neither more severe nor milder than usual.

SOURCES

Enteric infections are thought to be caused by man ingesting matter contaminated by infected human excreta (*2*) (*5*). Water, milk, food and flies are common vectors (*2*) (*5*). Diarrheal diseases are also caused by food infection and food poisoning, etc. (*6*) (*7*). There are diarrheas of unknown etiology (*6*). The usual sources of diarrhea were investigated as follows:

Water.—All 172 persons (47 families) obtained water from wells; 103 (30 families) from drilled wells, and 69 (17 families) from dug wells. With so many individual water supplies, water could not have been the source of the epidemic. As there were other verified cases from other parts of the county as far as 30 miles away, the possibility of subsurface water contamination is remote.

TABLE 5.—*Source of milk of 47 families surveyed. Families who did and did not have diarrhea are shown separately, Pinson, Ala., October 1946*

Source	Families with no cases	Families with diarrhea	Total
No milk used	0	2	2
Canned milk	0	1	1
Dairy A	1	9	10
Own cow	6	11	17
Neighbor's cow	9	5	14
Total	16	31	47

Milk.—Practically all milk used was raw. Despite this defect, the many different sources of milk rules this source out. (See table 5.) No recent illness had been noted among cows supplying milk to these families.

Sewage disposal, housing, and screening.—Of the 47 families, 45 lived in single houses. The other two families live in a two-family house. Sewage disposal facilities were good and there was excellent housing and screening. Toilet facilities are given in table 6.

TABLE 6.—*Toilet facilities of 47 families surveyed. Families who did and did not have diarrhea are shown separately, Pinson, Ala., October, 1946*

Toilet facilities	Families with no cases	Families with diarrhea	Total
Inside flush	6	13	19
Outside flush	1	0	1
Sanitary privy	8	10	18
Insanitary privy	0	7	7
No toilets	1	1	2
Total	16	31	47

All flush toilets were equipped with septic tanks. Only two of the 47 families had inadequate screening. The prevalence of flies was not measured, but appeared to be low. The weather was cool, with several frosts at night in October before the peak of the epidemic was reached.

Food.—All families prepared their food individually. Refrigeration was excellent, 131 persons (76 percent) had electrical refrigeration. Six persons had no refrigeration, and 35 persons used iceboxes. The character of the outbreak is not that of a food-borne disease, and food could not be incriminated.

Location of Cases.—A spot map was made locating cases. The map shows a uniform dispersion of cases throughout the surveyed area. Because no correlation is shown between the distribution of cases and any common factor except contact with known cases, this map is not reproduced.

Routine Stool Examination of Cases.—Stool specimens were collected in sterile bottles and taken to the Jefferson County Health Department Laboratory. The stools were watery in character and more or less opalescent in color. They contained no blood, pus, or mucus. Thirteen stools examined for pathogenic intestinal parasites showed none. *Blastocystis hominis*, a nonpathogenic vegetable cell, was found in one stool. Four of these stools were examined while fresh and warm for *Endamoeba histolytica* trophozoites, but none were seen.

Fourteen stool specimens were streaked directly onto S. S. agar and also put into selenite-F enrichment broth. (Four of these fourteen patients had received sulfasuccidine.) The latter were incubated 24 hours and streaked onto S. S. agar. After the S. S. agar plates (three to each stool specimen) had incubated 24 hours, non-lactose-fermenting and other suspicious colonies were picked to Krumwiede triple sugar agar. Reactors were transferred to 1% maltose, dextrose, lactose, mannite, dulcite, rhamnose, saccharose, xylose and sorbite media, incubated, and observed 14 days. No agglutinations were necessary as no suspicious organisms were found.

Transmission.—The incidence was 1 in 2.5 (40 percent). The secondary attack rate was 43.7 percent. Environmental sanitation was quite good. Common sources of diarrhea such as water, milk, and food did not seem to be implicated here. It is difficult to escape the conclusion that the diarrhea is contagious. Reimann and coworkers (*8*) filtered garglings and stools of persons with a disease similar to this one. They were nebulized and inhaled by 53 volunteers of whom 28 (53 percent) developed symptoms. Of 24 volunteers who ingested encapsulated filtrates of garglings and stools, none became ill. Out of 240, 22 (9 percent), apparently developed the disease naturally. The results were obtained in an epidemic period. Two attempts to repeat the performance in nonepidemic periods have met with equivocal results (*9*). The mode of transmission is still not definitely known.

Incubation period.—In 8 of the 13 closely questioned cases, there was a history of intimate exposure to a case ranging from 2 to 8 days previously (3-day median). The incubation period of 32 secondary cases was figured roughly as the number of days between the first day of illness of a primary case in a family and the first day of illness of the secondary cases in that family. Adding the 8 above to these 32 cases, 40 cases had a range of 1–12 days' incubation, again with a median of 3 days. Two incidents are given that illustrate what was frequently observed.

A music teacher visits Pinson twice a week. On Sunday, October 27, 1946, she spent the day giving lessons to school children at the Pinson Presbyterian Church. She left Pinson that night and returned again and worked all day Wednesday, October 30. Thursday, October 31, she had diarrhea (incubation period 1 day, 4 days, or longer), which lasted 4 days. Within a week 2 other young women in her home in Birmingham, where 16 girls live together, had cases of watery diarrhea lasting 2 to 4 days.

One of the field investigators left Pinson on Friday, November 15, 1946, after having spent the last 2 days there. Monday, November 18, was spent in the office. At 1 a. m. on Tuesday, the 19th, watery diarrhea started suddenly. There was no nausea or vomiting, but anorexia and severe malaise. He was prostrated and in bed for 6 days, and then became well with the surprisingly short convalescent period of less than 48 hours, leaving a 10-pound weight loss and no other sequelae. Three days after exposure, the person sitting next to him in the office had diarrhea for about 3 days. His wife had a 1-day diarrhea 4 days after he became ill.

Virus procedures.—Material was received from 14 different individuals who were in the acute stages of the diarrheal disease, 12 samples of feces, 7 nasal washings or garglings and 18 blood specimens.

Six of the latter were second specimens from the same individuals obtained after recovery.

Mice and guinea pigs were inoculated intraperitoneally and intranasally with both filtered and unfiltered fecal material from six of the cases. Two monkeys were likewise given unfiltered feces from two patients by nasal installations and other treated material intra-abdominally. None of the animals showed any symptoms. Mice were also given intranasal installations of mouth garglings treated with antibiotics (penicillin and streptomycin). A second passage of mouse lungs was made to other mice. So far results have been negative.

The major part of the laboratory investigations has been by innoculation of embroyonated hen's eggs by various routes. Two different series of inoculations were undertaken:

Series I.—In series I the Seitz filtrates of fecal specimens from six patients and nasal washings of three were inoculated into eggs, both by yolk sac and intra-allantoic routes. From three to five passages (seven in one instance) in eggs were made from each specimen using either a suspension of embryonic tissues, or allantoic fluid.

Stained slides from yolk sacs of many of the eggs failed to reveal any rickettsial or spirochetal organisms. Gram positive cocci were occasionally encountered, but these were considered to be of accidental origin. All passage material was cultured in broth, and only bacteria free tissues were inoculated.

In order to determine the possible presence of a virus of the influenza group, the allantoic fluid was removed from 194 different inoculated eggs, representing samples from each egg passage. These fluids were all tested for hemagglutinins by means of washed chicken red blood cells and occasionally washed guinea pig red blood cells.

Because positive agglutination was observed in a few instances, repeated passages were made in eggs. However, because there was no regularity in the results, these were considered to be nonspecific reactions, such as may occur if small amounts of albumin are included in the fluid (*10*). There was also no regularity in the death of the embryos, nor any increase in hemagglutination using guinea pig red blood cells as found by Burnet (*11*) for the "O" form of influenza virus.

Table 7 gives a summary of these results.

TABLE 7.—*Summary of series I virus procedures. Specimens are from 6 persons with acute watery diarrhea, Pinson, Ala., 1946*

Patient	Number of transfers from fecal filtrates	Allantoic fluids			Number of transfers from filtered nasal washings	Allantoic fluids			Remarks
		Number tested	Pos. to chick RBC	Pos. to G.P. RBC		Number tested	Pos. to chick RBC	Pos. to G.P. RBC	
D. E. H.	1	2	0	------	7	52	4	0	Embryos rarely died.
G. H.	2	5	0	------	------	------	------	------	All negative.
R. H.	5	26	4	0	------	------	------	------	Irregular deaths of embryos.
H. R.	4	11	1	------	5	31	2	1	Occasional deaths of embryo.
M. S.	3	47	6	1	------	------	------	------	Embryos rarely died.
A. S. H.	4	7	0	0	3	15	5	------	No regular embryoic fatalities after the first passage.

Series II.—In series II different methods were employed in the attempt to isolate an active agent. By means of the stab method, 8 or 9 day old embryonated eggs were inoculated into the ammiotic sac with the Seitz filtrates of fecal specimens from 6 patients, and also with the same material after addition of antibiotics. The specimens had been kept frozen for 6 weeks to 2 months. They were treated so as to contain 2,500 units of streptomycin and 250 units of penicillin per 0.05 cc., according to the method of Hodges (*12*). After standing at room temperature for ½ to 1 hour, the mixture was innoculated into eggs in 0.05 cc. amounts. Very rarely were any bacterial contaminations encountered in the eggs. Often a number of the embryos died within 24 hours, but since the cultures were negative, death was probably due to either trauma or perhaps a toxic factor from the feces. The same fatalities were also encountered in the eggs given the filtrates.

Mouth garglings from two patients were likewise treated in the same manner as previously described and innoculated via the amniotic route.

After 2–4 days incubation the living eggs were placed in the refrigerator over night. The extra embryonic fluids were then removed and the ambryos and membranes saved. Transfers were made from the embryos and also the allantoic fluids. As a rule very few embryonic deaths occurred. Because of the absence of lesions or fatalities among the embyros, it was difficult to know if a virus was present or not. For this reason an attempt was made to utilize the method of Habel (*13*) for the identification of the mumps virus by application of the complement fixation test. The tests were made by using the allantoic or amniotic fluids as antigen against the patient's serum.

Several positive results were obtained in the present study, but they were not considered of value because the same fluids not only reacted with the sera of the diarrhea patients, but also with normal sera from a different locality. Also, the tests were negative when using the allantoic fluids from the second and third egg passages. If a virus were present the tests should have continued to be positive. Further work is being continued in this regard, however.

In another attempt to determine if there was relationship between this diarrheal disease and the influenza viruses, the sera of several patients were tested for antibodies against the influenza viruses A and B. Since it was necessary to know if a rise in titer had occurred, sera taken both during acute stages of the disease and after recovery were tested at the same time by the antihemagglutinin method of Salk (*14*), using washed chicken red blood cells. Both early and late bleedings were available from only 4 persons; none of these had respiratory influenza during the intervening time periods. Their convalescent sera failed to show any rise in titer for either of the viruses.

Results of virus work.—After numerous attempts to isolate a virus by various methods in both embryonated eggs and small animals, none has been found as yet from either the fecal specimens or the nasal washings from a limited number of patients in this epidemic of diarrhea. Further studies are being made, however, especially in regard to the methods employed by Buddingh and Dodd (*15*).

SUMMARY

1. An epidemic of acute watery diarrhea is described which is probably the entity known as epidemic diarrhea, nausea and vomiting, intestinal influenza, etc. (*1*).

2. Primary symptoms, frequency and severity of symptoms are given.

3. Length of illness ranged from 1 to 14 days, with means of 5.1 days and median of 5 days.

4. Incidence was 1 in 2.5 (40 percent) with a secondary attack rate of 43.7 percent.
5. No age group was exempt.
6. There was no significant difference in the incidence of the disease in men and women.
7. There were no deaths nor other sequelae.
8. Environmental sanitation was good.
9. Water, food and milk did not appear to be possible sources.
10. None of the usual known causes of acute diarrhea (*6*) were found.
11. Incubation period based on known contact ranged, for 40 cases, from 1 to 12 days, with a median of 3 days.
12. Negative results of attempted virus isolation are given.

ACKNOWLEDGMENTS

We wish to express our appreciation to the following:

Dr. V. B. Link, Chief, Epidemiology Division, and Dr. S. E. Miller, Chief, Laboratory Division of the Communicable Disease Center, United States Public Health Service, Atlanta, Ga., for helpful comments. Dr. W. G. Smillie, of Cornell Medical College, Dr. J. M. Andrews and Dr. James Watt of the United States Public Health Service for helpful comments. Drs. A. S. Hutto and T. C. McKay of Pinson for their cooperation. Mr. F. R. Hunter, Mr. R. E. Glenn, Mrs. Alameda Young and others of the Jefferson County, Ala., Health Department, for bacteriological and parasitological examination of stool specimens. Mr. Dewey Wells and others of the Alabama State Health Department for bacteriological assistance. Miss Rachel Gorrie of the United States Public Health Service Virus Research Laboratory, Montgomery, Ala., for assistance in virus work. Rev. R. E. Gorham of the Pinson Presbyterian Church for providing field headquarters and other valuable assistance.

REFERENCES

(*1*) Reimann, H. A., Hodges, J. H., and Price, A. H.: Epidemic diarrhea, nausea and vomiting of unknown cause. J. A. M. A., 127: 1 (1945).

(*2*) Rosenau, M. J.: Preventive medicine and hygiene. New York, D. Appleton Century Co. 1935.

(*3*) Feibush, J. A.: Epidemic virus gastroenteritis in civilian population. N. Y. State J. M., 45: 1113 (1945).

(*4*) Maxcy, K. F.: Papers of Wade Hampton Frost, M. D. The Commonwealth Fund. 1941.

(*5*) Smillie, W. G.: Public health and preventive medicine. New York, The MacMillan Co. 1946.

(*6*) Hardy, A. V., and Watt, James: The acute diarrheal diseases. J. A. M. A., 124: 1173 (1944).

(*7*) Report of a committee of the American Public Health Association. The control of communicable diseases. Pub. Health Rep. Reprint No. 1697.

(*8*) Reimann, H. A., Price, A. H. and Hodges, J. H.: The cause of epidemic diarrhea, nausea and vomiting (viral dysentery). Proc. Soc. Exper. Biol. and Med., 59: 8 (1945).

(*9*) Reimann, H. A.: Personal Communication (January 8, 1947).
(*10*) Commission on acute respiratory diseases, Fort Bragg, N. C.: Hemagglutination by amniotic fluid from normal embryonated hen's eggs. Proc. Exper. Biol. and Med., **62:** 118–123 (1946).
(*11*) Burnet, F. M. and Bull, D. R.: Changes in influenza virus associated with adaptation to passage in chick embryos. Australian J. Exper. Biol. and Med. Sc., **21:** 55 (1943).
(*12*) Hodges, J. H.: The effect on the chick embryo of the simultaneous innoculation of stool, streptomycin, and penicillin. Science, **104:** 460 (1946).
(*13*) Habel, K.: Cultivation of mumps virus in the developing chick embryo and its application to studies of immunity to mumps in man. Pub. Health Rep., **60:** 201 (1945).
(*14*) Salk, J.: Simplified procedure for titrating hemagglutinating capacity of influenza-virus and corresponding antibody. J. Immunol., **49:** 87 (1944).
(*15*) Buddingh, G. J., and Dodd, K.: Stomatitis and diarrhea of infants caused by a hitherto unrecognized virus. J. Pediat., **25:** 105 (1944).

PLAGUE INFECTION IN DAWSON COUNTY, TEXAS

Plague in native rodents in Texas was reported from Cochran County during 1946 (PUBLIC HEALTH REPORTS **61**:910) and in Dawson County twelve miles southwest of Lamesa during May 1947 (PUBLIC HEALTH REPORTS **62**:929). Following these initial discoveries, the Texas State Department of Health, cooperating with the Communicable Disease Center of the United States Public Health Service, undertook a study of the ecology of the reservoirs and vectors of plague in the affected counties with a view toward determining factors influencing spread of the disease. Mr. Virgil I. Miles, entomologist, directs these field studies, and all rodent ectoparasites collected are forwarded to Dr. J. V. Irons, Director of Laboratories, Texas State Health Department, for the identification of plague and other pathogenic organisms. As a result of these studies, Dr. George W. Cox, Texas State Health Officer, announced on December 23, 1947, that plague infection again had been found in Dawson County; this time in a pool of 141 fleas from 14 pack rats (*Neotoma micropus*) collected on October 2 and 3, 1947, 8 miles west of Lamesa.

DEATHS DURING WEEK ENDED JAN. 24, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Jan. 24, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	10,244	9,958
Median for 3 prior years	9,958	
Total deaths, first 4 weeks of year	42,125	40,765
Deaths under 1 year of age	722	855
Median for 3 prior years	622	
Deaths under 1 year of age, first 4 weeks of year	2,945	3,378
Data from industrial insurance companies:		
Policies in force	66,902,625	67,288,974
Number of death claims	14,575	13,687
Death claims per 1,000 policies in force, annual rate	11.4	10.7
Death claims per 1,000 policies, first 4 weeks of year, annual rate	10.9	9.8

FEDERAL-STATE-LOCAL RELATIONSHIPS IN THE FINANCING OF LOCAL HEALTH SERVICES[1]

By MALCOLM H. MERRILL, M. D., M. P. H., *Deputy Director and Chief, Division of Laboratories, California State Department of Public Health*

INTRODUCTION

The story of the development of the American democratic system is one of growth of local community government with its various services, followed by association of a group of communities into States, and finally the banding together of States into a nation. In line with this general trend, health services for the most part originated in the local community. As their value was demonstrated, health services of various patterns were established in an increasing number of communities. The result was a most uneven distribution of such services. To obtain more complete service within a community and wider distribution over the area, States began setting up State health programs. The aim was to assure greater protection of health for the people of the State as a whole. In spite of the progress made over the years it is evident today that wide variations in public health services still exist. With full recognition of these inequalities, the Federal Government became interested in aiding the public health program on a Nation-wide basis.

These trends have resulted in the development of a rather complex system of intergovernmental relationships between the local, State, and Federal levels of government. Public Health services themselves are actually rendered in the homes and agencies of local communities under the authority of the local government where well organized, well staffed, well equipped and well operated health units are needed. Efforts of the State and National governments should be aimed principally at facilitating local development. That this fact is appreciated by leaders of the public health movement has been dramatically reemphasized by the recent campaign spearheaded by the American Public Health Association to blanket the nation with efficient local health units.

Our problem is how to guide the development of intergovernmental relationships to promote efficient local health services. The first essential in the achievement of this objective is adequate financing. This has become more and more a shared function of the three levels of government. The Federal Government has initiated a system of grants-in-aid to States. In the utilization of these funds, the States either provide the services directly to the local communities or they establish a second system of grants-in-aid to local governmental agencies.

---

[1] Paper presented at the meeting of the Western Branch American Public Health Association, San Francisco, May 28, 1947.

The following paper presents a history of the development of these intergovernmental relationships. The necessity of financial participation by all three levels of government is indicated. Some possible approaches to the methods of redistribution of Federal and State funds to local health departments is also presented.

WHY A GRANT-IN-AID PROGRAM

The primary purposes in the initiation of a Federal grant-in-aid program were twofold: first, to improve the standard of health service throughout the county, and second, to increase the quantity of service particularly in those areas with limited financial resources. But why are Federal grants-in-aid necessary to accomplish these purposes? The answer lies in the differing sources of public revenue.

The system of taxation in our country has been so developed that the revenue raising power of local governmental units has been markedly restricted. It is limited primarily to the taxation of real and personal property. The State has more latitude while the Federal Government has almost unlimited taxing power. The practical application of this principle is illustrated by the taxes collected in California in 1945 by the three levels of government. Local governments collected about $38 per capita, the State $65 and the Federal Government $403. Federal taxes were four times the State plus local taxes, and more than ten times local taxes alone.

A second reason for a grant-in-aid program is to equalize the public health services throughout the country by a redistribution of wealth. California is said to be a wealthy State. It contributes about 10 percent of the Federal revenue. It has over 7 percent of the Nation's population. Yet it receives less than 4 percent of the money allotted for public health by the Federal agencies. By such a system of grants-in-aid it is possible to secure more even distribution of health services throughout the country by diverting money from the wealthy to the poorer States.

The State and Federal levels of government are tending more and more to subsidize local governmental agencies to assist them in financing various local programs. Examples are: Old age pensions, aid to the blind, indigent relief, subsidies for education, for road construction, for public building programs, and to a more limited extent, for public health. Such a pattern of financial cooperation between the three levels of government is probably a permanent element of our economy. The only alternative would appear to be a fundamental change in our tax structure which is not currently contempleted.

HISTORY

Federal-State Relationships.—The idea of Federal grants-in-aid for health purposes was proposed as long ago as 1879 when a bill creating the short-lived National Board of Health was under consideration by Congress.

The United States Public Health Service began the program of assisting States in 1913, when funds were obtained for "Field Investigations of Public Health." This embraced limited field studies on typhoid fever and was followed, in 1916, by congressional appropriations for demonstrations in rural sanitation. In both these instances funds were administered on a project basis and Public Health Service personnel were assigned to States to assist in the projects. The first example of formal allotments to States was in 1918 when $1,000,000 was appropriated by Congress for venereal disease control. Here, for the first time there was an actual transfer of money to the State for public health purposes. This allocation to States was on a basis of the ratio of the population of any given State to the total population of the United States. This appropriation was discontinued after the First World War.

In 1921, Congress passed the Sheppard-Towner Act which appropriated money to the United States Children's Bureau to assist States in the development of maternal and child health services. Again funds were actually transmitted to the States. There was a basic allotment of $5,000 to each State, $5,000 more to each State if matched and the remainder was allotted on a basis of population. Here two factors were used in determining allotment and population. This program continued until 1929.

With the passage of the Social Security Act in 1935, Congress formally embarked upon a program of grants-in-aid to States for public health. The framework of the allotment procedure was provided in the law. In title VI, which has since become Public Law 410, grants were authorized by the United States Public Health Service. The law prescribed that three basic factors should be considered in determining the allocation of these funds, namely, population, financial need, and extent of the health problem. Under title V administered by the United States Children's Bureau, two additional factors were noted in the law, namely a basic allotment to each State and a requirement for special attention to rural areas. The latter was in reality a slight attempt at definition of criteria to be used in determining the extent of the problem. Both agencies provide for special demonstration or study projects. The Childrens' Bureau places more emphasis on such special projects and upon aid to rural areas then does the Public Health Service.

State-local relationship in California.—While the above Federal-State fiscal relationships have been developing, California, as other States, has been gradually evolving a State-local fiscal pattern. Until 1918, State aid to local jurisdictions was almost exclusively through the provision of direct services. These included primarily epidemiological investigations, laboratory services and services in the field of environmental sanitation. The one exception was the State subsidy for all resident tuberculosis patients hospitalized at public expense which was begun in 1914.

With the coming of Federal funds for venereal disease control in 1918, a new pattern of State administration of aid to local health departments came into being. The State employed personnel and assigned them to local health departments and clinics. Allocations to local areas were made on a basis of the State's estimates of needs and the willingness of the local communities to participate. This same general plan was later utilized but to a lesser extent, in the administration of the Sheppard-Towner funds appropriated by Congress for maternal and child health. Most of this activity was in rural areas which had no full time health service so the State provided a direct service in this field.

The pattern of assignment of State personnel was resumed when Social Security funds became available in 1936 and continued until the 1945–46 fiscal year when a limited number of health departments entered into contracts with the State and received the subsidy in the form of funds rather than assigned personnel. This procedure was extended during the 1946–47 fiscal year and will be made almost uniformly applicable during the coming year.

There has thus evolved a procedure through which Federal funds may be channeled to local health departments without disrupting the essential independence and responsibility of the local unit. The agreements are surrounded by regulation with adequate safeguards to insure reasonably efficient utilization of such funds by the local health department.

While this administrative procedure for the handling of the funds has been developing, the adoption of some kind of formula for determining how the funds shall be distributed within the State has lagged behind. Heretofore, the estimate by State personnel of the extent of the problem, together with the willingness of the local health department to undertake new activities, has played the predominant part in determining how the funds were allocated. This has resulted in a most uneven distribution of funds by the State to local health departments. During the past 2 years studies have been under way, designed to solve this problem.

Out of these studies has come the realization that Federal funds available, plus local funds now being appropriated, are inadequate to do the job regardless of how the Federal funds are distributed. This inadequacy of funds was the genesis of the legislation introduced into the current session of the California Legislature to provide a State subsidy for local health work.[2] It was concluded that the only way State-wide coverage, with reasonably adequate local health services could be obtained would be by active State, as well as the Federal, participation in the financing of local health programs.

---

[2] This act became effective September 19, 1947. The act and regulations of the State Board of Public Health adopted to administer the act are available upon request.

Three other conclusions have also evolved. First, it is necessary to establish a businesslike fiscal relationship between the State health department and the local health unit. This has been largely accomplished through the formal contractual procedure. Second, it is necessary to develop a formal procedure for determining allotments to local health departments. Third, development of formal minimum standards that must be met by the local health department in order to be eligible is also necessary for subsidy. In the proposed State subsidy act, the allotment procedure is established by law. It is a model of simplicity. The type of local health unit eligible for subsidy is defined. The minimum standards that must be met are to be established by regulation of the State Board of Public Health after consultation with and approval by the Conference of Local Health Officers. After minimum standards are met by the local health department, the allotment is based on two easily defined criteria. First, a basic allotment of $16,000 per county, or 60 cents per capita, whichever is less, will be made; second, the remainder of the funds will be allotted on a straight per capita basis. There is a requirement that each dollar of State funds allotted on the per capita basis be matched by 2 dollars of local funds, thus assuring local financial participation. State funds may not be substituted for currently appropriated local funds.

Behind this simple allotment procedure there were many months of study, analysis and discussion. The chief considerations will now be briefly summarized.

THE PROBLEM OF A BASIC ALLOTMENT

It has already been noted that in the Children's Bureau formula there is a basic allotment established for each State. There are three primary reasons for provision of such an allotment. The first reason is to provide extra assistance to smaller or sparsely populated areas. The per capita cost for rendering the basic health services in such sparsely populated areas and in small health units is greater than in more densely populated regions. A second primary reason for favoring the concept of a basic allotment is the practical fact that the development of full time health service has lagged in the rural areas of the State. Twenty-seven counties in California are currently without full time health service. A third reason is that, in general, the rural sparsely populated areas are less wealthy and consequently less able to finance a health department than are the more populous areas. These three elements, namely, scattered population with increased cost of operation of health departments serving small populations, delay and lack of development of services in rural areas, and less ability to finance the program, combine to emphasize the necessity for providing extra stimulus to the development of full time health units in these rural areas. One further consideration that applies particularly to California is the State-wide interest in maintenance of a high quality of health service in rural areas used as vacation lands by vast numbers of our population.

At the same time it was determined that the basic allotment should be limited to a minimum geographic area of a county. This was done in order to discourage cities or areas of the counties from setting up separate health jurisdictions. Therefore, regardless of the size of its population, each county would receive the same basic allotment, however, with the proviso that a per capita maximum would establish a ceiling for small counties. In order to encourage rural counties to combine, the allotment continues to be figured on a county basis regardless of how many counties combine into a single health unit. In other words, the cards are stacked in favor of countywide health units and in favor of two or more rural counties combining to form single health units.

Under the proposed law in California, the basic allotment is $16,000 per county or 60 cents per capita, whichever is less. Rural, sparsely populated counties would, therefore, receive a basic allotment of 60 cents per capita. Los Angeles County, with a population in excess of 3,000,000, would receive a basic allotment of approximately 0.4 cents per capita. Such a procedure provides for marked encouragement toward the formation of full-time health departments in the rural areas in the State. Actually the larger proportion of the State subsidy would go into the metropolitan areas. Los Angeles County, with about 40 percent of the population, on a basis of $3,000,000 available, would receive about 29 percent of the total funds available for allotment.

FINANCIAL NEED AS A FACTOR IN A FORMULA

Financial need plays a prominent part in the formulas of the Federal agencies. It is determined on a basis of the reciprocal of the per capita income. The higher the per capita income of a State, the less the financial need. In general, Federal taxes are levied on a basis of income. However, local taxes are collected on a basis of assessed valuation of property and the tax rate applied thereto. It was, therefore, thought that perhaps assessed valuation should be the criteria used to determine the relative financial need of a county. This has been used in certain other States. A study was made of this possibility. It was found that assessed valuation in California varies from county to county from about 25 percent to 75 percent of the real value of the property. Furthermore, the tax rates applied in 1945 varied from $1.19 to $5.05 per $100 of assessed values. There were thus two variable factors in 1945 which resulted in a range of per capita property taxes from $18.46 to $97.92. It was found that the per capita property tax bore little or no relationship to per capita income of the respective counties. It was concluded that neither assessed valuation, tax rate, nor per capita property tax provided a reasonable basis on which to evaluate the financial need of a county.

In California, the chamber of commerce has provided estimates of the per capita income of counties for a number of years. These varied from $638 to $2,192 per capita in 1945. If any criterion of financial need is to be used, it was concluded that this would be the best measure. Using these indices just as is done by the Federal agencies, San Francisco on this basis of financial need, would receive about one-fifth as much per capita allotment as the State average. Amador, a rural mountain county, would receive four and one-half times the State average. Other counties range between these limits. This procedure, therefore, establishes a wide range of difference in allotments, actually quite comparable to the differences between States on the national level.

Per capita income as a measure of financial need is essentially just as feasible a factor for use to determine allotments within California as it is on a national level to determine State allotments.

EXTENT OF THE PROBLEM AS A FACTOR IN THE FORMULA

A study was made to determine whether or not objective criteria could be found that would provide a reasonable estimate of the variations in the extent of health problems throughout the State. Tuberculosis, venereal diseases, and maternal and child health were selected as three separate fields for study. By the objective criteria that were set up, it was possible to demonstrate a rather wide range of differences among the counties of the State in each of these categories. The use of such data in determining allotments based on extent of the problem did result in a marked variation from straight per capita allotment for each of the funds when figured separately. However, when all funds were combined there was a definite tendency to neutralize each other and hence the end result was about the same as when all funds were pooled and allotted on a straight per capita basis. This was the most revealing and unexpected finding of the entire study and is really the basis for our throwing out entirely attempts to utilize the factor of extent of the problem in an allotment formula. In other words, all the statistical gymnastics resulted in such a small change in the actual allotments that it appeared completely impractical to utilize such data in a formula.

POPULATION AND BASIC ALLOTMENT

Population constitutes the most readily useful and undoubtedly the most satisfactory single criterion for determining allotments to counties.

The variation in the population composition from county to county in California as enumerated in 1940 is not sufficiently great to render practicable any attempts to place differing values on such factors as racial distribution and age composition.

After a full study of all of the factors noted above, it was concluded that essentially the same purpose could be achieved by the utilization of the two factors of basic allotment and population as was achieved by extensive attempts to bring into a formula the intricacies of financial need and extent of the problem. It was, therefore, on a basis of these studies that the legislation in California was drawn to provide a simple formula that could be readily understood by all as a basis for determining allotments to local health jurisdictions. The basic pattern, at least in its relation to California, is applicable regardless of the amount of money available for allotment.

While the plan has not been formally adopted with reference to the allotment of Federal funds, we are gradually adjusting allocations to conform to this pattern.

SUMMARY AND CONCLUSIONS

In this discussion I have attempted to outline briefly the development of Federal-State-local relationships in the field of public health. Here is a most interesting experiment in the application of the democratic process. Will we evolve a pattern of progressively increasing centralization of authority in this field to the end that the local health department will merely carry out policies and procedures dictated from above? Or will we keep before us the concept that our primary objective is the development of efficient local health units with adequate freedom to operate and adequately financed to render effective community service? The three levels of government are becoming partners in the financing. It is imperative that they also be partners in the planning and in the determination of policies and procedures.

We need keep on guard lest the operation of our partnership become so involved that we spend all of our time and energy in needless controversies. For every operation we should ask ourselves, "Is there a simpler way?"

By a pattern of Federal to State and State to local subsidy we are attacking the problem of adequate financing of local health services. By the pattern of a conference of local health officers to advise with the States and a conference of State health officers to advise with the Federal agencies it is hoped we can avoid arbitrary and bureaucratic administration at the State and Federal levels to the end that the partnership will function smoothly and in the interest of the people we serve.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED January 31, 1948 *

Summary

A total of 14,253 cases of influenza was reported for the current week, as compared with 11,687 last week and a 5-year (1943–47) median of 4,852. The net increase was accounted for chiefly in the reports for Alabama, Arizona, and California. Of the current total, 13,037 cases (91 percent) were reported in 7 States of the South Atlantic, South Central, Mountain, and Pacific areas, as follows (last week's figures in parentheses): Virginia 969 (949), South Carolina 1,279 (1,218), Alabama 1,576 (344), Arkansas 599 (586), Texas 5,088 (5,027), Arizona 1,666 (1,274), and California 1,860 (1,065). Only 4 other States reported more than 99 cases or an increase of more than 37, Wisconsin 159 (last week 108), Tennessee 113 (last week 233), Louisiana 106 (last week 7, next earlier week 180), and Oklahoma 184 (last week 161). The total since the first of the year is 46,635, as compared with 16,910 for the same period last year, the latter figure being the lowest for the period in the past 5 years (the highest 261,981 in 1944, the 5-year median 17,421 for the period).

Of 30 cases of poliomyelitis reported for the week (last week 46, 5-year median 36), only 4 States reported more than 2 cases—North Carolina and Texas 5 each and Florida and Louisiana 3 each. The total for the year to date is 157, as compared with 299 for corresponding period last year and a 5-year median of 147.

For the first 4 weeks of the year, figures above the corresponding median expectancies have been reported for the dysenteries (combined), influenza, measles, poliomyelitis, Rocky Mountain spotted fever, undulant fever and whooping cough.

Deaths recorded during the week in 93 large cities of the United States totaled 10,421, as compared with 10,244 last week, 9,602 and 10,100, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47), median of 10,069. The cumulative figure for the 5 weeks ended January 31 is 52,546, as compared with 50,367 for the corresponding period last year. Infant deaths during the week in the same cities totaled 677, as compared with 722 last week, and a 3-year median of 602. The total for the 5-week period is 3,619, as compared with 4,187 for the same period last year.

---

*Exclusive of figures for Pennsylvania for the current week, report not received.

Telegraphic morbidity reports from State health officers for the week ended Jan 31, 1948, and comparison with corresponding week of 1947 and 5-year median*

In these tables a zero indicates a definite report, while leaders imply that, although none was reported cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median, 1943-47	Week ended—		Median, 1943-47	Week ended—		Median, 1943-47	Week ended—		Median, 1943-47
	Jan. 31, 1948	Jan. 25, 1947		Jan. 31, 1948	Jan. 25, 1947		Jan. 31, 1948	Jan. 25, 1947		Jan. 31, 1948	Jan. 25, 1947	
NEW ENGLAND												
Maine	1	7	3	5	1	1	2	191	27	0	0	2
New Hampshire	0	0	0	1	---	---	---	1	5	0	1	1
Vermont	2	0	0	2	15	15	---	123	19	0	0	0
Massachusetts	4	21	3	---	---	---	288	427	377	2	1	3
Rhode Island	1	3	0	---	---	---	1	63	22	0	0	1
Connecticut	0	0	1	---	2	14	57	204	185	3	4	3
MIDDLE ATLANTIC												
New York	20	29	11	[1] 5	[1] 6	[1] 14	719	147	928	5	7	27
New Jersey	6	3	3	5	6	24	654	193	93	2	3	7
Pennsylvania*	---	16	12	(3)	[2] 10	[2] 10	---	708	738	---	8	16
EAST NORTH CENTRAL												
Ohio	14	17	12	5	8	9	629	380	111	2	2	10
Indiana	13	12	8	32	2	14	430	19	71	1	1	4
Illinois	0	5	6	1	3	4	1,792	12	273	2	1	16
Michigan [3]	1	7	7	4	2	2	1,014	66	135	1	5	6
Wisconsin	0	0	1	159	31	93	234	132	132	3	2	8
WEST NORTH CENTRAL												
Minnesota	6	6	6	1	---	2	406	23	19	0	1	2
Iowa	2	3	3	---	---	---	485	7	22	0	0	1
Missouri	4	6	6	6	4	5	59	10	96	0	4	7
North Dakota	3	1	1	---	1	14	52	2	2	0	0	0
South Dakota	0	0	0	---	---	---	14	10	48	2	0	0
Nebraska	0	3	3	13	4	4	29	6	14	0	0	1
Kansas	1	3	5	79	75	54	3	1	101	1	0	1
SOUTH ATLANTIC												
Delaware	0	0	0	---	---	---	23	---	10	0	0	1
Maryland [3]	15	8	9	3	5	15	76	33	32	2	0	2
District of Columbia	0	0	0	---	---	4	33	14	14	0	0	2
Virginia	3	10	10	969	490	567	165	201	124	1	0	6
West Virginia	11	4	4	99	93	67	269	---	11	0	1	2
North Carolina	14	9	11	---	---	---	2	171	92	2	1	7
South Carolina	10	2	8	1,279	595	810	17	32	32	1	0	1
Georgia	7	2	7	77	22	154	33	90	34	1	2	5
Florida	2	4	4	55	16	7	37	18	35	0	2	3
EAST SOUTH CENTRAL												
Kentucky	6	4	7	2	2	19	28	2	97	1	4	5
Tennessee	5	6	6	113	60	105	63	42	86	4	7	7
Alabama	9	10	10	1,576	107	379	9	35	20	2	5	7
Mississippi [3]	6	7	7	50	---	---	37	---	---	1	2	5
WEST SOUTH CENTRAL												
Arkansas	2	7	7	599	78	150	79	14	90	0	1	3
Louisiana	2	4	6	106	29	29	14	1	13	1	0	4
Oklahoma	2	4	7	184	134	192	26	1	7	0	0	0
Texas	26	26	57	5,088	2,280	2,280	692	115	173	8	5	8
MOUNTAIN												
Montana	7	0	1	15	29	29	163	122	84	0	0	0
Idaho	0	1	1	14	15	1	9	5	10	1	2	0
Wyoming	0	0	0	---	6	6	24	6	21	0	0	0
Colorado	10	6	8	85	44	113	54	9	95	1	0	3
New Mexico	3	1	3	8	---	5	25	55	8	0	0	0
Arizona	7	3	3	1,666	149	155	11	71	15	0	0	1
Utah [3]	2	1	1	---	39	39	9	5	33	0	0	0
Nevada	0	0	0	---	---	---	---	---	1	0	0	0
PACIFIC												
Washington	5	4	7	19	1	1	122	39	88	0	1	5
Oregon	3	3	4	68	7	35	30	36	42	1	1	3
California	8	21	35	1,860	17	89	538	104	430	13	4	21
Total	243	289	331	14,253	4,388	4,852	9,456	3,846	6,712	64	78	242
4 weeks	972	1,277	1,355	46,635	16,910	17,421	32,861	14,795	20,285	327	344	953
Seasonal low week [4]	(27th) July 5-11			(30th) July 26-Aug. 1			(35th) Aug. 30-Sept. 5			(37th) Sept. 13-19		
Total since low	7,330	8,843	9,794	90,193	49,885	49,885	67,807	37,682	46,409	1,109	1,316	2,472

[1] New York City only. [2] Philadelphia only. [3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

*Exclusive of figures for Pennsylvania for the current week; report not received.

Telegraphic morbidity reports from State health officers for the week ended Jan. 31, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—Jan. 31, 1948	Week ended—Jan. 25, 1947	Median 1943-47	Week ended—Jan. 31, 1948	Week ended—Jan. 25, 1947	Median 1943-47	Week ended—Jan. 31, 1948	Week ended—Jan. 25, 1947	Median 1943-47	Week ended—Jan. 31, 1948[5]	Week ended—Jan. 25, 1947	Median 1943-47
NEW ENGLAND												
Maine	0	0	0	22	31	31	0	0	0	0	0	0
New Hampshire	0	2	0	2	2	12	0	0	0	0	0	0
Vermont	0	1	0	4	4	8	0	0	0	2	0	0
Massachusetts	0	3	1	94	154	314	0	0	0	2	3	2
Rhode Island	0	0	0	4	25	13	0	0	0	0	0	0
Connecticut	0	0	0	24	43	65	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	0	5	2	213	323	404	0	0	0	2	3	3
New Jersey	0	1	0	67	138	135	0	0	0	0	2	1
Pennsylvania[*]	------	2	0	-------	246	254	------	0	0	------	7	5
EAST NORTH CENTRAL												
Ohio	1	1	1	306	389	318	0	0	0	3	0	0
Indiana	1	1	1	65	114	114	0	3	1	0	3	2
Illinois	1	1	2	152	162	201	0	0	0	3	1	1
Michigan[3]	0	3	0	140	154	154	0	0	0	1	0	0
Wisconsin	0	1	0	87	98	145	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	0	1	0	38	66	67	0	0	0	0	0	0
Iowa	0	1	0	56	46	61	0	0	0	0	0	0
Missouri	0	0	0	48	30	93	0	0	0	0	0	0
North Dakota	0	0	0	2	6	13	0	0	0	0	0	0
South Dakota	0	0	0	0	8	34	0	0	0	0	0	0
Nebraska	0	3	0	22	36	59	0	0	0	0	0	0
Kansas	0	1	1	20	60	75	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	8	15	6	0	0	0	0	0	0
Maryland[3]	0	0	0	29	37	81	0	0	0	0	1	1
District of Columbia	0	0	0	14	15	29	0	0	0	0	0	0
Virginia	0	0	0	29	40	74	0	0	0	2	1	2
West Virginia	1	0	0	27	36	36	0	0	0	0	3	0
North Carolina	5	2	1	30	34	56	0	0	0	2	0	0
South Carolina	0	0	0	7	4	9	0	0	0	1	0	1
Georgia	0	0	0	13	22	23	0	0	0	1	0	3
Florida	3	3	2	5	10	11	0	0	0	2	1	2
EAST SOUTH CENTRAL												
Kentucky	0	0	0	37	50	50	1	0	0	0	0	0
Tennessee	1	0	0	31	33	41	0	0	0	0	0	2
Alabama	0	0	0	14	11	12	0	0	0	0	1	1
Mississippi[3]	0	1	0	3	8	11	0	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas	1	0	0	3	3	7	1	0	0	2	0	0
Louisiana	3	2	1	6	2	8	0	0	0	6	2	3
Oklahoma	1	0	0	13	13	15	0	0	0	2	0	0
Texas	5	2	4	55	49	65	0	0	0	4	2	3
MOUNTAIN												
Montana	2	1	0	20	9	9	0	0	0	1	0	0
Idaho	0	1	0	3	7	14	0	0	0	0	1	1
Wyoming	0	0	0	4	9	9	0	0	0	0	0	0
Colorado	0	0	1	23	54	68	0	0	0	0	2	0
New Mexico	0	1	0	10	11	11	0	1	1	0	0	0
Arizona	0	1	0	12	9	12	0	0	0	0	5	0
Utah[3]	0	0	0	19	24	53	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	1	0	2	52	56	56	0	0	0	0	1	0
Oregon	2	0	0	31	25	34	0	0	0	1	0	0
California	2	18	11	108	123	302	0	0	1	3	0	2
Total	30	60	36	1,972	2,844	3,401	2	4	7	40	39	46
4 weeks	157	299	147	8,325	9,688	14,150	11	17	34	151	166	201
Seasonal low week[4]	(11th) Mar. 15-21			(32d) Aug. 9-15			(35th) Aug. 30-Sept. 5			(11th) Mar. 15-21		
Total since low	10,368	25,096	13,547	30,841	38,374	52,471	32	71	117	3,560	3,694	4,784

---

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately as follows: Vermont 2; Illinois 1; Michigan 1; Oklahoma 1; Texas 1; Oregon 1; California 1.

Telegraphic morbidity reports from State health officers for the week ended Jan. 31, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Jan. 31, 1948	Whooping cough: Week ended— Jan. 25, 1947	Whooping cough: Median, 1943–47	Week ended January 31, 1948: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	30	40	40	------	------	------	------	------	------	------	------
New Hampshire	3	------	9	------	------	------	------	------	------	------	------
Vermont	55	17	21	------	------	------	------	------	------	------	2
Massachusetts	69	190	171	------	9	------	1	------	------	------	1
Rhode Island	10	19	24	------	------	------	------	------	------	------	------
Connecticut	37	42	63	------	------	------	------	------	------	------	13
MIDDLE ATLANTIC											
New York	157	219	219	5	3	------	2	------	------	------	8
New Jersey	------	182	106	2	------	------	------	------	------	------	1
Pennsylvania*	------	252	138	------	------	------	------	------	------	------	------
EAST NORTH CENTRAL											
Ohio	95	186	169	1	------	------	------	------	------	------	1
Indiana	27	48	22	------	1	------	------	------	2	------	4
Illinois	83	94	91	4	6	------	------	1	2	------	20
Michigan [3]	108	274	142	2	------	------	------	------	------	------	------
Wisconsin	87	194	97	------	------	------	------	------	1	------	5
WEST NORTH CENTRAL											
Minnesota	46	8	37	1	------	1	------	------	------	------	2
Iowa	2	15	15	------	------	------	------	------	------	------	10
Missouri	22	48	28	------	------	1	------	------	4	4	1
North Dakota	6	1	2	------	------	3	------	------	------	------	------
South Dakota	3	9	5	------	------	------	------	------	------	------	1
Nebraska	11	17	3	------	------	------	------	------	------	------	3
Kansas	41	21	36	------	------	------	1	------	1	------	------
SOUTH ATLANTIC											
Delaware	2	10	7	------	------	------	------	------	------	------	------
Maryland [3]	44	75	49	------	------	------	------	------	------	------	------
District of Columbia	6	3	5	------	------	------	------	------	------	------	------
Virginia	72	74	56	2	------	29	------	------	1	------	3
West Virginia	34	------	22	------	------	------	------	------	------	------	------
North Carolina	41	38	99	------	------	------	1	------	2	3	------
South Carolina	91	45	53	2	26	------	1	------	1	------	------
Georgia	16	14	14	1	1	------	1	------	5	3	3
Florida	24	46	16	5	------	------	------	------	1	5	1
EAST SOUTH CENTRAL											
Kentucky	4	27	30	------	------	------	------	------	------	------	------
Tennessee	17	25	31	1	------	------	2	------	3	------	------
Alabama	19	27	27	2	------	------	------	------	1	1	------
Mississippi [3]	4	------	------	3	------	------	------	------	------	2	------
WEST SOUTH CENTRAL											
Arkansas	23	3	17	8	------	6	------	------	1	------	1
Louisiana	10	6	6	7	------	------	------	------	------	3	------
Oklahoma	39	4	7	------	------	------	------	------	------	------	1
Texas	264	426	241	11	289	138	------	------	1	3	7
MOUNTAIN											
Montana	11	13	19	------	------	------	------	------	------	------	------
Idaho	9	3	3	------	------	------	------	------	------	------	2
Wyoming	2	4	4	------	------	------	------	------	------	------	------
Colorado	164	10	20	------	------	------	------	------	------	------	14
New Mexico	10	16	4	------	------	------	------	------	------	------	------
Arizona	39	15	15	------	------	19	------	------	------	------	2
Utah [3]	8	------	14	------	------	------	------	------	------	------	6
Nevada	------	------	------	------	------	------	------	------	------	------	------
PACIFIC											
Washington	39	32	32	------	------	------	------	------	------	------	1
Oregon	25	11	10	------	------	------	------	------	------	------	4
California	75	115	138	7	6	------	1	------	------	------	2
Total	1,984	2,918	2,459	64	341	197	10	1	26	24	119
Same week: 1947	2,918	------	------	48	722	163	6	0	68	47	92
Median 1943–47	2,459	------	------	26	258	89	6	0	17	47	[6] 68
4 weeks: 1948	9,305	------	------	231	1,388	1,254	24	3	101	80	386
1947	9,500	------	------	125	1,815	827	26	1	222	202	342
Median 1943–47	8,985	------	------	115	1,422	525	32	0	104	246	[6] 268

---

[3] Period ended earlier than Saturday.

[6] 3-year median 1945–47.

Alaska: Common respiratory 13; diphtheria 2; chickenpox 2; German measles 5; impetigo 1; tonsillitis 4; pharyngitis 3; scarlet fever 2; pneumonia 1; vincent's angina 1.

Territory of Hawaii: Bacillary dysentery 1; measles 1; whooping cough 8; scarlet fever 1.

WEEKLY REPORTS FROM CITIES*

City reports for week ended Jan. 24, 1948

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	1	0	2	0	2	0	0	10
New Hampshire:												
Concord	0	0	------	0	------	0	1	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	3	0	------	0	268	1	17	0	14	0	0	10
Fall River	0	0	------	0	------	1	1	0	0	0	0	5
Springfield	0	0	------	0	1	0	1	0	3	0	0	4
Worcester	0	0	------	0	------	0	2	0	12	0	0	4
Rhode Island:												
Providence	0	0	------	0	------	0	4	0	3	0	0	4
Connecticut:												
Bridgeport	0	0	------	0	1	0	0	0	7	0	0	1
Hartford	0	0	------	0	3	0	2	0	2	0	0	2
New Haven	0	0	------	0	------	1	2	0	6	0	0	9
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	1	------	0	2	0	5	0	0	7
New York	7	0	2	1	403	1	67	2	74	0	1	26
Rochester	0	0	------	0	------	0	3	0	14	0	0	2
Syracuse	0	0	------	0	4	0	1	0	4	0	0	11
New Jersey:												
Camden	1	0	------	0	8	0	1	0	1	0	0	1
Newark	1	0	2	0	29	0	3	0	15	0	0	11
Trenton	7	0	------	0	4	1	3	0	3	0	0	1
Pennsylvania.												
Philadelphia	1	1	3	1	77	1	14	0	53	0	1	31
Pittsburgh	0	0	------	0	------	2	7	0	14	0	0	3
Reading	0	0	------	0	2	0	2	0	4	0	0	11
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	13	0	7	0	14	0	0	1
Cleveland	2	0	4	1	2	2	7	0	30	0	0	13
Columbus	3	0	2	2	115	0	2	0	9	0	0	7
Indiana:												
Fort Wayne	1	0	------	0	1	0	3	0	4	0	0	------
Indianapolis	2	0	1	1	75	0	4	1	7	0	0	4
South Bend	0	0	------	0	------	0	0	0	0	0	0	------
Terre Haute	0	0	------	0	30	0	1	0	2	0	0	------
Illinois:												
Chicago	2	0	1	1	404	2	29	0	49	0	0	30
Springfield	0	0	------	0	84	0	1	0	2	0	0	------
Michigan:												
Detroit	2	0	------	0	22	0	11	0	42	0	0	30
Flint	0	0	------	0	------	0	1	0	0	0	0	------
Grand Rapids	0	0	------	0	244	0	2	0	1	0	0	4
Wisconsin:												
Kenosha	0	0	------	0	21	0	0	0	0	0	0	------
Milwaukee	0	0	------	0	5	0	6	0	18	0	0	14
Racine	0	0	------	0	41	0	2	0	2	0	0	2
Superior	0	0	------	0	4	0	0	0	5	0	0	------
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	------	0	0	0	3	0	0	5
Minneapolis	1	0	------	0	150	0	4	0	13	0	0	23
St. Paul	0	0	------	1	23	0	8	0	6	0	0	6
Missouri:												
Kansas City	0	0	7	2	4	0	4	0	3	0	0	13
St. Joseph	0	0	------	0	------	0	0	0	2	0	0	------
St. Louis	8	0	7	1	11	0	12	0	16	0	0	1
Nebraska:												
Omaha	0	0	------	0	------	0	2	0	3	0	0	------
Kansas:												
Topeka	0	0	------	0	------	1	1	0	0	0	0	------
Wichita	0	0	------	0	1	0	5	0	1	0	0	7

---

* In some instances the figures include nonresident cases.

City reports for week ended Jan. 24, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	------	1	1	0	0	0	0	------
Maryland:												
Baltimore	3	0	1	0	------	2	9	0	19	0	0	35
Cumberland	2	0	------	0	------	0	1	0	3	0	0	------
Frederick	0	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	63	0	2	0	11	0	0	5
Virginia:												
Richmond	1	0	------	1	2	0	2	0	4	0	0	8
Roanoke	0	0	------	0	------	0	0	0	1	0	0	------
West Virginia:												
Charleston	0	0	------	0	5	0	5	0	0	0	0	------
Wheeling	0	0	------	0	1	0	3	0	1	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	0	2	0	0	0	0	------
Wilmington	0	0	------	0	------	0	1	0	0	0	0	------
Winston-Salem	0	0	------	0	------	0	1	0	0	0	0	3
South Carolina:												
Charleston	0	0	46	1	3	0	4	0	0	0	0	5
Georgia:												
Atlanta	0	0	27	0	------	0	4	0	1	0	0	------
Brunswick	0	0	------	0	2	0	0	0	0	0	0	------
Savannah	0	0	5	0	------	0	0	0	2	0	0	1
Florida:												
Tampa	3	0	5	0	24	0	3	0	0	0	1	10
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	26	0	8	0	8	0	1	11
Nashville	0	0	------	1	------	0	3	0	1	0	0	------
Alabama:												
Birmingham	0	0	11	1	------	1	9	1	0	0	0	2
Mobile	0	0	18	1	------	0	2	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	7	0	------	0	3	1	0	0	0	2
Louisiana:												
New Orleans	1	0	1	0	1	1	12	3	3	0	0	2
Shreveport	0	0	------	0	------	0	1	0	0	0	0	------
Oklakoma:												
Oklahoma City	0	0	2	0	------	0	3	0	2	0	0	1
Taxas:												
Dallas	4	0	1	1	1	0	0	0	5	0	0	7
Galveston	0	0	------	0	------	0	0	0	0	0	0	------
Houston	0	0	3	1	------	0	12	0	0	0	0	------
San Antonio	1	0	3	2	------	2	15	0	1	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	1	3	2	0	0	0	0	0	1
Great Falls	0	0	------	0	------	0	2	0	1	0	0	------
Helena	0	0	------	0	------	0	0	0	0	0	0	------
Missoula	0	0	------	0	------	0	0	0	3	0	0	5
Idaho:												
Boise	0	0	------	0	------	0	2	0	0	0	0	------
Colorado:												
Denver	2	0	6	0	49	0	4	0	6	0	0	28
Pueblo	1	0	------	0	------	0	1	0	2	0	0	23
Utah:												
Salt Lake City	0	0	------	0	7	0	0	0	2	0	0	------
PACIFIC												
Washington:												
Seattle	0	0	------	0	4	0	7	2	19	0	0	15
Spokane	0	0	1	0	2	0	0	0	2	0	0	------
Tacoma	0	0	------	0	63	0	0	0	2	0	0	------
California:												
Los Angeles	0	0	254	12	28	1	4	0	18	0	0	8
San Francisco	0	0	49	0	146	0	5	0	9	0	0	12
Total	59	1	469	34	2,476	23	373	10	594	0	4	495
Corresponding week, 1947[1]	86	------	61	19	968	------	434	------	665	0	12	749
Average 1943-47[1]	77	------	745	[2] 45	[3] 2,393	------	[2] 491	------	1,099	1	10	666

[1] Exclusive of Oklahoma City.

[2] 3-year average, 1945-47.

[3] 5-year median, 1943-47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (latest available estimated population, 34,445,600)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	7.8	0.0	0.0	0.0	716	7.8	83.6	0.0	128	0.0	0.0	128
Middle Atlantic	7.9	0.5	3.2	1.4	242	2.3	47.7	0.9	87	0.0	0.9	48
East North Central	7.3	0.0	4.9	3.0	645	2.4	46.2	0.6	112	0.0	0.0	64
West North Central	18.1	0.0	28.2	8.0	380	2.0	62.3	0.0	95	0.0	0.0	107
South Atlantic	14.9	0.0	139.0	3.3	165	5.0	62.9	0.0	70	0.0	1.7	111
East South Central	0.0	0.0	171.2	17.7	153	5.9	129.8	5.9	53	0.0	5.9	77
West South Central	15.2	0.0	43.2	10.2	5	7.6	116.8	10.2	28	0.0	0.0	30
Mountain	23.8	0.0	47.7	7.9	469	15.9	71.5	0.0	111	0.0	0.0	453
Pacific	0.0	0.0	498.5	19.7	398	1.6	26.2	3.3	82	.00	0.0	57
Total	9.0	0.2	71.2	5.2	376	3.5	56.6	1.5	90	0.0	0.6	75

Anthrax.—Cases: Boston 1; Philadelphia 1.
Dysentery, amebic.—Cases: New York 9; New Orleans 1; Los Angeles 1.
Dysentery, bacillary.—Cases: Providence 1; Philadelphia 1; Los Angeles 1.
Dysentery, unspecified.—Cases: Baltimore 4; San Antonio 2.
Typhus fever, endemic.—Cases: Tampa 3; New Orleans 2; Dallas 1.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—According to information dated January 27, 1948, plague infection in rodents found in Hamakua District, Island of Hawaii, T. H., has been reported as follows: 1 rat found in District 12B in Hamakua Mill area; 1 rat found in District 2A in Kukuihaele area; 1 rat found in District 9A in Paauhau area; 1 mouse found in District 1A in Kukuihaele area.

Virgin Islands of the United States

Notifiable diseases—October—December 1947.—During the months of October, November, and December 1947, cases of certain notifiable diseases were reported in the Virgin Islands of the United States as follows:

Disease	October	November	December	Disease	October	November	December
Ascariasis	2			Mumps	14	43	26
Chickenpox	1			Paratyphoid fever	1		
Dysentery:				Pneumonia (all forms)		1	9
Amebic		1		Schistosomiasis	2		
Unspecified	1		2	Syphilis	24	7	14
Filariasis	4	3	1	Tetanus	2		1
Gonorrhea	10	13	8	Trichinosis		1	
Hookworm disease	8	3	5	Tuberculosis	2	1	5
Impetigo contagiosa			1	Typhoid fever		1	1

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended January 10, 1948.—Certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox	-------	49	2	156	504	44	55	174	152	1,136
Diphtheria	-------	-------	1	15	1	-------	-------	2	3	22
Dysentery, amebic	-------	-------	-------	6	2	-------	-------	-------	-------	8
German measles	-------	-------	-------	2	19	4	-------	13	12	50
Influenza	-------	12	-------	-------	3	-------	-------	-------	4	19
Measles	6	2	-------	572	811	7	6	35	61	1,500
Meningitis, meningococcus	-------	-------	-------	1	1	-------	1	1	1	5
Mumps	-------	82	-------	210	195	29	33	84	17	650
Poliomyelitis	-------	1	-------	-------	-------	-------	-------	-------	4	5
Scarlet fever	5	7	17	71	97	3	4	9	14	227
Tuberculosis (all forms)	-------	1	10	51	18	24	9	56	-------	169
Typhoid and paratyphoid fever	-------	-------	1	9	-------	-------	-------	1	2	13
Undulant fever	-------	-------	-------	1	-------	-------	-------	2	1	4
Venereal diseases:										
Gonorrhea	1	19	16	111	70	34	26	63	107	447
Syphilis	1	8	3	58	38	12	3	5	33	161
Other forms	-------	-------	-------	-------	-------	-------	-------	-------	2	2
Whooping cough	-------	4	-------	37	29	31	2	68	28	199

FINLAND

Notifiable diseases—November 1947.—During the month of November 1947, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	7	Paratyphoid fever	254
Diphtheria	495	Poliomyelitis	30
Dysentery	5	Scarlet fever	295
Gonorrhea	1,257	Syphilis	380
Malaria	3	Typhoid fever	41

JAPAN

Notifiable diseases—4 weeks ended December 27, 1947, and accumulated totals for the year to date.—For the 4 weeks ended December 27, 1947, and for the year to date, certain notifiable diseases were reported in Japan as follows:

Disease	4 weeks ended Dec. 27, 1947		Total reported for the year to date (52 weeks)	
	Cases	Deaths	Cases	Deaths
Diphtheria	1,963	226	28,345	2,393
Dysentery, unspecified	252	142	39,253	7,434
Encephalitis, Japanese "B"	-------	0	[1] 252	[1] 131
Gonorrhea	14,570	-------	211,097	-------
Influenza	[2] 154	-------	[3] 3,040	-------
Malaria	261	1	11,802	24
Measles	[2] 2,053	-------	[3] 464,895	-------
Meningitis, epidemic	93	29	3,370	1,101
Paratyphoid fever	192	7	4,721	267
Pneumonia	[2] 7,952	-------	[4] 115,708	-------
Scarlet fever	181	4	2,633	61
Smallpox	1	0	391	38
Syphilis	11,880	-------	147,022	-------
Tuberculosis	[2] 13,609	-------	[3] 282,308	-------
Typhoid fever	651	92	17,776	2,231
Typhus fever	80	3	1,115	86
Whooping cough	[2] 2,243	-------	[3] 128,298	-------

---

[1] Suspected; diagnosis confirmed in 7 cases.
[2] For 3 weeks; report for week ended Dec. 6, not received.
[3] For 51 weeks only.
[4] For the period Mar. 30 to Dec. 27, exclusive of the week ended Dec. 6.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

Cholera

Indochina (French).—For the month of November 1947, 109 cases of cholera with 81 deaths were reported in French Indochina.

Plague

Madagascar.—For the period December 21–31, 1947, 28 cases of plague with 18 deaths were reported in Madagascar, including 21 cases with 12 deaths reported in Fianarantsoa, 1 fatal case in Tamatave, and 6 cases with 5 deaths reported in Tananarive.

Peru—Lima.—Information dated January 27, 1948, reports 1 confirmed case of plague in the city of Lima, Peru.

Siam (Thailand).—Plague infection has been reported in Siam as follows: Week ended January 3, 1948, 13 cases, 2 deaths; week ended January 17, 1948, 15 cases of plague with 1 death were reported in 3 towns in northeast Siam.

Smallpox

China—Shanghai.—For the week ended January 10, 1948, 78 cases of smallpox were reported in Shanghai, China.

Ecuador.—Smallpox has been reported in Ecuador as follows: For the month of December 1947, 557 cases with 13 deaths were reported in all of Ecuador. For the week ended January 17, 1948, 45 cases were reported in Quito and 25 cases (alastrim) with 2 deaths were reported in Guayaquil.

Honduras.—For the month of October 1947, 2 cases of smallpox were reported in Honduras.

Lebanon—Beirut.—For the week ended January 17, 1948, 15 cases of smallpox were reported in Beirut, Lebanon.

Libya—Tripolitania.—For the week ended January 10, 1948, 23 cases of smallpox were reported in Tripolitania, Libya.

Mexico—Mexico State.—For the week ended January 17, 1948, 47 cases of smallpox were reported in Mexico State, Mexico.

Venezuela—Maracaibo.—For the period January 2–12, 1948, 12 cases of smallpox were reported in Maracaibo, Venezuela. From the beginning of the outbreak in the last week of December 1947, up to January 12, 1948, a total of 75 cases of smallpox with 1 death were reported.

Yellow Fever

Colombia.—For the month of December 1947, 1 death from yellow fever was reported in La Dorado, Caldas Department, and 1 death from the same disease was reported in San Martin, Intendencia of Meta, Colombia.

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON: 1948

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 **FEBRUARY 27, 1948** NUMBER 9

IN THIS ISSUE

Epidemic Tinea Capitis: A Public Health Problem

Relative Productivity of Newer Coliform Media

Incidence of Communicable Diseases in the U. S.

Notifiable Diseases, Fourth Quarter, 1947

U.S. PUBLIC HEALTH SERVICE
1798

CONTENTS

Page
Epidemic tinea capitis: a public health problem. Richard K. C. Lee 261
Relative productivity of newer coliform media. Elsie Wattie 269
Incidence of communicable diseases in the United States, January 4–31, 1948 275
Deaths during week ended January 31, 1948 277
Notifiable diseases, fourth quarter, 1947 278

INCIDENCE OF DISEASE

United States:

Reports from States for week ended February 7, 1948, and comparison with former years 283

Weekly reports from cities:

City reports for week ended January 31, 1948 287
Rates, by geographic divisions, for a group of selected cities 289

Territories and possessions:

Panama Canal Zone—Notifiable diseases—December 1947 289

Foreign reports:

Canada—Provinces—Communicable diseases—Week ended January 17, 1948 290

Cuba—

Habana—Communicable diseases—5 weeks ended January 3, 1948 290
Provinces—Notifiable diseases—5 weeks ended January 3, 1948 290
Norway—Notifiable diseases—October 1947 291

World distribution of cholera, plague, smallpox, typhus fever, and yellow fever—

Cholera 291
Plague 292
Smallpox 293
Typhus fever 295
Yellow fever 296

Public Health Reports

Vol. 63 ● FEBRUARY 27, 1948 ● *No. 9*

Printed With the Approval of the Bureau of the Budget, as Required by Rule 42 of the Joint Committee on Printing

EPIDEMIC TINEA CAPITIS: A PUBLIC HEALTH PROBLEM[1]

By Richard K. C. Lee, M. D., Dr. P. H.

Ringworm of the scalp is caused by several species of fungi, the most common being the *Microsporon audouini* and *Microsporon lanosum*. The *M. audouini* is capable of causing widespread outbreaks. Other species of fungi causing sporadic cases of tinea capitis are the *M. fulvum*, *Achorion schoenleinii* (*favus*), and other trichophyton organisms. This paper will deal chiefly with the *M. audouini* infections.

In recent years, epidemic outbreaks of ringworm of the scalp in large city areas, especially in the eastern United States, have been repeatedly reported in dermatological and general medical literature. Little has been written in public health journals and the author believes that there should be greater recognition by public health officials of the seriousness of this communicable disease.

INCIDENCE

As early as 1899, Dr. C. J. White reported on ringworm as it existed in Boston. Lewis and Hopper in 1939 reported a series of 278 cases observed and treated at the New York Post Graduate Medical School and Hospital during the period between 1935 and 1938. All of these cases were proved by culture— *M. audouini* accounting for 39.3 percent and *M. lanosum*, 39.6 percent, together causing 229, or 78.9 percent, of the cases. Benedeck and Felscher of Chicago reported 140 cases for the period between May 1, 1940, through August 31, 1942. Of this number, 81.5 percent were due to *M. audouini* and 12.2 percent to *M. lanosum*. Livingood and Pillsbury of Philadelphia in 1941 reported a series of 130 cases, 125, or 96.2 percent of which were due to *M. audouini*.

Lewis, Hopper, and Reiss reported 312 cases at the New York Hospital from July 1, 1943, to June 30, 1945. *M. audouini* was present in 275 of these cases.

Miller, Lowenfish, and Beattie at the Vanderbilt Clinic in New York City reported from January 1, 1943, to May 1, 1945, 928 new cases of which 96.9 percent were caused by *M. audouini*. In their report it is stated that in 1931, of the 52 cases treated at the Vanderbilt Clinic, 70 percent were due to *M. audouini* and 30 percent to *M. lanosum*. In 1944, at this same clinic, 509 cases were treated, 96.7 percent of which were due to *M. audouini* and 2.5 percent to *M. lanosum*.

---

[1] Reprinted with emendations, by permission from the Winslow Anniversary number of the Yale Journal of Biology and Medicine, Vol. 18, No. 4, 1947.

Lewis, Silvers, Cipollaro, Muskatblit, and Mitchell reported in 1944 that of the 432 cases occurring in Astoria Queens, New York, during an epidemic in 1943, 411 were due to the *M. audouini*. Statistics at the New York Skin and Cancer Hospital show that during the period from 1935 to 1942, 292 of the 616 cases of tinea capitis reported were due to *M. audouini*. In 1943, of 572 cases of tinea capitis treated there, 496 were due to *M. audouini*.

Lynch reported that the estimates of the incidence of the infection in Chicago varied from 5,000 to 65,000 cases. In St. Paul the disease increased to a point where the Minnesota Dermatological Society was impelled in 1944 to call to the attention of public health authorities, the danger of an impending epidemic. At the time of his report he estimated that there were between 150 and 500 cases of the disease in St. Paul.

Carrick has reported on an interesting and valuable survey in 1946 among Detroit elementary school children. Of 3,565 children selected at random in a city-wide survey, 96, or 2.7 percent, showed evidence of infection under filtered ultraviolet light. On the basis of total enrollment of children susceptible to tinea, it was estimated that there were about 6,000 cases of ringworm of the scalp among the 220,291 children in Detroit public schools. In this survey, the principal of each of the 21 schools of the 7 large districts in Detroit selected alphabetically every fifth child under 13 years of age for examination under Wood's light.

Ringworm of the scalp has an epidemic character and is prevalent and widespread in schools and institutions. Many children with this infection are kept out of school for an average of 6 months or more. Some cases are cured in 6 months but others remain under treatment and out of school for several years.

Epidemics of ringworm of the scalp resulting from *M. audouini* have occurred in Europe, especially in France and England, for years. In the United States, sporadic epidemics have been observed and reported but it was not until about 1942 that widespread epidemics were reported in the large eastern cities. One of the first outbreaks was reported in Astoria, New York City, by Lewis, Silvers, Cipollaro, Muskatblit, and Mitchell. They felt that the outbreaks resulted from the fact that during the war there was decreased maternal care and supervision, and that infected children were moved from place to place because of changes of residence of their parents who were in the armed forces or were war workers. During this period most of the children's institutions were crowded and had inefficient supervision. It is also pointed out that the disease was inadequately dealt with by health authorities, partly because of ignorance concerning its epidemiology, lack of experience with the epidemic character of the disease, procrastination because the disease causes no mortality, and the difficulty of carrying out a diagnostic and treatment program of city-wide proportions.

CHARACTERISTICS OF THE DISEASE

Ringworm of the scalp is characterized by localized, round scaly patches of alopecia with short broken-off hair. The fungus invades the hair and hair follicle, multiplies, and progresses down the wall of the follicle. Soon large numbers of mycelia form around the hair between it and the walls of the follicle. The mycelia and spores increase and proceed downward in the hair to the point where the hair bulb begins. The hair papilla which is responsible for the reproduction of new hair is never involved in this process. However, the hair will break off at the weakest point, which is the position of greatest parasitic invasion, just a few millimeters above the surface of the scalp. The bottom end of the hair is still infected and because it remains in the follicle, the infection goes on. As fast as the hair grows upward, it is filled with spores and mycelia. Until some means is used to get the whole hair out en masse, or there is developed a vehicle containing the fungicide that can penetrate into the hair follicle, it is practically impossible to cure this disease. The X-ray has fortunately furnished one such means.

The spread of infection to other parts of the scalp and to other persons is easily brought about by thousands of parasites on the smallest piece of hair which breaks off and falls on new regions of the skin or scalp. Infection is readily transmitted from one child to another by the interchange of caps, mufflers, barber shop instruments, backs of subway and theater seats, etc.

In *M. audouini* infections there is very little inflammatory reaction around the lesion and only a small percentage of cases show this. Livingood and others have found that where there is a localized inflammatory reaction manifested by redness, pustular or true kerion reaction, the prognosis for cure by local medication is very good. Tinea capitis caused by the animal type fungus, which produces an inflammatory reaction of varying degrees, gives a much better prognosis and responds readily to treatment without the need of such intensive therapy as X-ray epilation. The pustular and inflammatory reaction aids in the spontaneous expulsion of the infected hair.

The incubation period of this infection is undetermined, the period of communicability remaining as long as the fungus or its spores can be found at the site of the lesions. Susceptibility in childhood is universal. Reinfection is common and there is no immunity after cure. *M. audouini* infection, known as the human type, is rare after puberty, while adults as well as children are susceptible to the animal type, *M. lanosum*, which is transmitted by contact with lesions or hairs from lesions of cats and dogs.

PREVENTION AND CONTROL

Methods for prevention and control include the early recognition and reporting of the disease. It, like any other communicable disease, requires isolation and early and adequate treatment of each case to prevent spread of the infection to other areas of the scalp and body of the same individual as well as to prevent its spread to other children. Infected children should be excluded from school until recovery, and in institutions the infected should be separated from healthy children. Each child should use a stocking cap or other type of inexpensive head covering which can be destroyed by burning after use. All home, school, and other contacts with children under fifteen years of age should be examined with suitably filtered ultraviolet light at regular intervals until the source case is completely cured. The health or school department should have available filtered ultraviolet equipment and a nurse trained in the technique of examining the scalp under the Wood's light to carry on the case-finding activity in the school and among preschool children in the home. Schools and institutions in epidemic areas should carry on a case-finding program every 3 months. The examining team should be equipped or have available instruments to take material for microscopic examination and cultures. The general practitioner's responsibility is limited primarily to suspicion of the disease and referral of the child to clinics or specialists where all facilities for adequate diagnosis and treatment can be carried out.

Funds should be available to provide adequate personnel and diagnostic and treatment facilities for the early and immediate treatment of infected cases. Educational material describing ringworm of the scalp in simple terms should be given to every parent of the school child. Other educational tools should be used in epidemic areas. In *M. audouini* infections X-ray epilation is still the treatment of choice followed by local fungicide treatment. Such treatment results in the most rapid cure and least loss of school time. Precautions should be taken to prevent reinfection after X-ray treatment. Cleanliness of the hair and scalp and education of the parents and school authorities must be maintained on a continual basis. The health department should register all cases of ringworm of the scalp to insure prompt and adequate treatment for every infected child. Public health nurses should be available for the follow-up of cases after epilation to insure adequate treatment.

Schwartz, Peck, Botvinick, Leibovitz, and Frasier have advocated that infected children be permitted to attend school provided they have had their hair cut closely and wear caps while on the school premises and that treatments are given with topical medicaments. In the Hagerstown, Maryland, outbreak which started in 1944, a full-time officer of the United States Public Health Service was assigned to work with the deputy State health officer. He remained in charge from August 1944 to November 1945 with a staff assisting him. During that period a total of 8,657 children ranging from 6 weeks to 18 years of age were examined. Five hundred sixty-five (479 boys and 86 girls) were found to be infected. Of the cases among these children only eight were not due to *M. audouini*. It was found that over 65 percent of the boys had the infection in the "clipper area." In the treatment program, in which 17 topical remedies were tried, trained personnel carried on intensive, closely supervised care through daily treatments at clinics. The results achieved among the 493 treated at the United States Public Health Service clinic were as follows: (*a*) 48 were cured by manual epilation with 1 or 2 treatments; (*b*) 274 were cured by topical application; (*c*) 126 discontinued treatment before being pronounced cured; and (*d*) 45 were under treatment at the close of the study period. Salicylanilide ointment 5 percent in carbowax 1500 and copper undecylenate saturated solution in carbowax 1500 were the most effective remedies.

Thallium sulfate for epilation of the hair is not recommended because of the danger of complications. Preparations as recommended by MacKee, Hermann, and Karp at the New York Skin and Cancer Hospital and by Schwartz, Peck, Botvinick, Leibovitz, and Frasier of the United States Public Health Service should be utilized especially in areas where there is a lack of qualified dermatologists, roentgenologists, and technicians capable of the exacting technique and after-care. In restless and young children and in cases where X-ray treatment is not always successful or advisable, local therapy must be tried. Carrick used copper oleate, undecylenate-undecylenic acid and propionate-propionic acid as fungicides for 171 cases during the period from October 1944 to March 1946 and reported cured cases in about 41 percent of the total number treated in this manner.

Strickler reports that 64 percent, or 74 cases of *M. audouini* scalp infection out of 115, were cured with 3 percent solution of acetic acid in iodine along with a wetting agent.

Mitchell and Story emphasized the importance of the teacher and school nurse as the first line of defense. They also stressed the need for follow-up of family contacts and for parental education.

Citing as an example an outbreak that was quickly stopped in his community, Gaul reports that the early recognition of the disease and use of the Wood's light will prevent the spread of scalp ringworm in a community.

Criteria for diagnosis should include clinical evidence of the disease, characteristic fluorescence on examination of the scalp with Wood's light, demonstration of the fungi on direct microscopic examination, positive culture in all cases, and identification of the organism.

Criteria for cure should include the absence of clinical evidence of infection, absence of fluorescence when scalp is examined under Wood's light, and negative cultures for ringworm on any scale or any other likely material which can be obtained. Three negative cultures while the patient is under treatment and three negative cultures while without treatment taken at weekly intervals should be sufficient for the cultural requirements. Any equivalent to this requirement would be satisfactory.

DISCUSSION

Tinea capitis infection is most commonly found among the poor, living in crowded and unsanitary housing conditions. In large families all children become affected, and in institutions and crowded schools the disease spreads rapidly. Many cases are treated topically by general practitioners for months before they are referred to qualified dermatologists or clinics. Many dermatologists, health departments, and schools do not have available the Wood's light so necessary for diagnosis and follow-up of the course of treatment. Every large city health department should have available the filtered ultraviolet lamp and should also be able to provide microscopic and cultural diagnostic facilities.

Health officials, nurses, teachers, and others in the field of public health and welfare should become better acquainted with this disease, its course, and its treatment. There is a real lack of knowledge among private physicians and health workers as to the nature of epidemic ringworm infection of the scalp resulting from the *M. audouini.* The long course of the disease and the ease with which it is spread make this infection a serious one. The cost and time required for treatment, the psychic insults the infected child undergoes, and the long restriction necessarily imposed on his activities are conditions which make early and adequate treatment imperative. Cipollaro and other leading dermatologists in the eastern United States have continued to stress in their writings the need for organized public health action in the prevention and control of this epidemic disease.

X-ray epilation followed by local therapy under supervision is the recommended treatment by most authors. Where such facilities and qualified personnel are not available to carry out this method of treatment, the procedure recommended by Schwartz and Peck may be followed. Local treatment with penetrating liquid vehicles or other penetrating bases should be more widely utilized since X-ray epilation is not the ideal method. Immunological and harmonological methods should also be investigated further.

Lynch emphasized several warning points. Before epilation the use of topical applications is not only a waste of time but unless the applications are very mild the irradiation must be delayed until any reaction has subsided. Inadequate or fractional dosage with X-rays is also to be decried because all these exposures have cumulative and permanent effects and an epilation dose cannot be administered after any considerable amount of previous roentgen treatment has been given.

The results of a spot questionnaire to State and city health departments in August 1946 showed that tinea capitis was a reportable disease in the States of Missouri, Pennsylvania, Illinois, and Ohio, and the cities of Cleveland, Chicago, Philadelphia, and St. Louis. Reporting was not required by State health departments of New York, New Jersey, California, Connecticut, Louisiana, Maryland, Massachusetts, and Texas, and the city health departments of Baltimore, Los Angeles, Jersey City, Newark, New Orleans, Boston, and New York. In Newark and Jersey City the health officers state that tinea capitis is a public health problem, but the reporting of the disease was not required by regulations or law. In New York City, where a large number of cases were reported by clinics and physicians, the disease is not reportable. In a public school survey from September 1, 1943, to June 30, 1944, out of 200,000 children examined, 2,208 cases were reported and from September 1, 1944, to June 22, 1945, out of 429,933 children examined, 1,719 cases were found positive.

Philadelphia reported 2,669 cases during the years 1944 and 1945; St. Louis, 1,237 cases in 1945; Jersey City, 600, since 1944; Cleveland, 530 in 1944 and 1945; Chicago, 1,623 in 1946; and Illinois, 1,399 in 1945. In Chicago, the percentage of school children showing evidence of infection with ringworm was 2.5 percent in 1945, and 1.5 percent in 1946.

Strict exclusion of children from school was practiced in Philadelphia, Los Angeles, New Orleans, and New York City, and in the States of Texas, Missouri, and New Jersey. Children with tinea capitis infections who are under medical supervision and treatment are permitted to attend school in Baltimore, Cleveland, Jersey City, Newark, St. Louis, Boston, Chicago, and the States of California, Connecticut, Illinois, Louisiana, Maryland, Massachusetts, New Jersey, New York and Ohio. (Most of the latter named States have no regulations on this subject.)

Although reporting and exclusion from school is recommended by the Subcommittee on Communicable Disease Control of the Committee on Research and Standards of the American Public Health Association and officially approved by the United States Public Health Service, there is little uniformity of compliance with these recommendations by State and city health departments. Criteria for diagnosis and cure and facilities offered by health departments for diagnosis, treatment, and follow-up are variable. In order to obtain adequate control and knowledge of this epidemic disease, it is recommended that State and city health departments follow the standards of the American Public Health Association. Only thus can accurate information on the prevalence of the disease become available. Where there are adequate facilities and qualified personnel to carry on a program of treatment and supervision such as that conducted by Schwartz and his associates in Hagerstown, Maryland, health officials may be justified in allowing infected children to attend school. Otherwise, strict compliance with recommended standards should be followed to obtain maximum control of this epidemic infection of children.

CONCLUSION

The successful control of epidemics of tinea capitis infection resulting from *M. audouini* will take place when health departments become aware of the need for early diagnosis and early and adequate treatment of every case. The disease should be reportable in every city in the United States having a population of over 100,000 so long as there are epidemic areas existing in neighboring communities. The filtered ultraviolet lamp, microscopic and cultural facilities, personnel to assist in case-finding, diagnostic and follow-up clinics, periodic surveying, and educational dissemination of information about the disease are all necessary services that should be available in every large city. Treatment by qualified dermatologists should also be available, and those individuals who are unable to pay for private care should be treated under Government auspices. Communities free of the disease should take active steps to prevent its introduction and to localize any foci that may take place. In epidemic areas separate isolated classrooms for infected children may be found necessary. Health departments that are permitting infected children to attend regular classes without close supervision by qualified personnel and intensive treatment are assuming a serious risk of endangering other children. Tinea capitis caused by *M. audouini* is an epidemic communicable disease and should be treated as such.

REFERENCES

(1) Benedeck, T., and Felscher, I. M.: Epidemiology of tinea capitis. Arch. Dermat. & Syph. **49:** 120 (1944).

(2) Carrick, L.: Methods of local therapy for tinea capitis due to *Microsporon audouini*. J. A. M. A. **131:** 1189 (1946).

(3) Carrick, L.: The epidemiology of tinea capitis in Detroit school children. J. Michigan Med. Soc. **45:** 347 (1946).

(4) Gaul, L. E.: Ringworm of the scalp due to *Microsporon audouini*. J. Iowa Med. Soc. **35:** 255 (1945).

(5) Lewis, G. M., Silvers, S. H., Cipollaro, A., Muskatblit, E., and Mitchell, H. H.: Measures to prevent and control an epidemic of ringworm of the scalp. New York State J. Med. **44:** 1327 (1944).

(6) Lewis, G. M., Hopper, M. E., and Reiss, F.: Ringworm of the scalp. J. A. M. A. **132:** 62 (1946).

(7) Livingood, C. S., and Pillsbury, D. M.: Ringworm of the scalp–prolonged observation, family investigation, cultural and immunologic studies in 130 cases. J. Invest. Dermat. **4:** 43 (1944).

(8) Lynch, F. W.: Ringworm of the scalp. J. Lancet. **65:** 228 (1945).

(9) MacKee, G. M., Hermann, F., and Karp, F. L.: A new treatment for anthrophilic tinea tonsurans. J. Invest. Dermat. **43:** 7 (1946).

(10) McCarthy, L.: Diagnosis and treatment of diseases of the hair. St. Louis, Mo., The C. V. Mosby Company, 1940.

(11) Miller, J. L., Lowenfish, F. P., and Beattie, S. F.: Local treatment of tinea capitis. J. A. M. A. **132:** 67 (1946).

(12) Mitchell, H. H., Story, L. S., and MacDonald, J.: An epidemic of ringworm of the scalp. Pub. Health Nursing. **35:** 564 (1943).

(13) Schwartz, L., Peck, S. M., Botvinick, I., Leibovitz, A. L., and Frasier, E. S.: Control of ringworm of the scalp among school children. J. A. M. A. **132:** 58 (1946).

(14) Spencer, G. A.: Ringworm infection of the scalp in the Harlem area. New York State J. Med. **44:** 13 (1944).

(15) Strickler, A. Tinea capitis: Its treatment with special iodine and dilute acetic acid. J. A. M. A. **132:** 65 (1946).

RELATIVE PRODUCTIVITY OF NEWER COLIFORM MEDIA [1]

By Elsie Wattie, *Bacteriologist, United States Public Health Service*

In water bacteriology continual search is made for a presumptive medium for the determination of the coliform group which will be as productive as standard lactose broth and, at the same time, will fail to produce a high percentage of false positive presumptive tests. The newer media in this field for the detection of bacteria of the coliform group, which are reported to have given promising results, are lauryl sulphate tryptose broth (L. S. T.) by Mallman (*1*) and *Escherichia coli* broth (E. C.) by Perry (*2, 3*). In the work reported at this time these two media and standard lactose broth have been used as presumptive media in the examination of water samples. The samples examined were of varying quality ranging from tap water to highly polluted water. The latter types were stored at room temperature under aerobic and anerobic conditions during the period of examination.

In the examinations, at least three concentrations were planted in decimal dilution, with three or five duplicate portions at each dilution of each sample. For waters of good quality, the initial portions were 100 ml. each. The presumptive tubes of all three media were incubated at 37° C. and examined for gas production at the ends fo 24-hour and 48-hour periods. Confirmation was started as soon as gas production was observed.

In the case of the E. C. media, triplicate sets of presumptive tubes were inoculated. As previously stated, one set of these tubes was incubated at 37° C., and the other two sets at 45.5° C., air and water immersion respectively. Early results at 45.5° C. showed that not only those of the coliform group, but also the *Esch. coli*, were quantitatively lower than those obtained from the standard procedure. This temperature was then reduced to 44° C., air and water immersion which English workers recommended as the highest that can be used successfully for the detection of coli.

All tubes showing gas production in any amount were subjected to the confirmed test by transfer to brilliant green lactose bile broth and to eosin methylene blue agar plates in conformance with standard procedures. Confirmed cultures were purified by short time incubation in lactose broth at 37° C. and restreaking on eosin methylene blue agar plates, and then subjected to the standard Completed Test. IMViC (Indol, methyl-red, Voges-Proskauer, citrate) and gelatin liquefaction reactions were determined on all cultures which were completed.

In making these comparisons, at least two methods of presenting the data may be used: (1) The total number of completed positive tubes for each medium may be compared regardless of the dilution in which they occurred (this is the usual procedure), or (2) the most probable numbers of organisms, based on the confirmed or completed test, as determined by the various media, may be compared. In either case, to obtain a true comparison, results for all of the samples included in any grouping must be available for each of the media, and at all temperatures studied. That is, if a sample failed to give a determinate result with one medium, then the results from the same sample with the other media used must be omitted from the average. Thus, in the average data presented at this time, only results of identical samples are included. For this reason, the results of many samples had to be eliminated from the averages. Moreover, in the examination of waters of high quality the results from a considerable number of samples which did not yield a positive result with any of the media under study have necessarily been omitted from consideration.

---

[1] From Sanitary Engineering Division, Water and Sanitation Investigations Station, Cincinnati, Ohio.

Table 1.—*Comparison of efficiency of presumptive media for coliform determination on basis of total number of gas-forming tubes which gave a positive result from the completed test*

Medium under test	Temperature of incubation (°C.)	Total number tubes showing gas	Tubes positive by completed test		Percent positive coliforms	Percent positive *Esch.* coli	Percent maximum *Esch.* coli
			Number	Percent			
1	2	3	4	5	6	7	8
Standard	37	985	529	53.7	98.5	27.2	98.9
L. S. T	37	842	537	63.8	100.0	27.5	100.0
E. C	37	631	471	74.6	87.7	23.9	86.9
E. C	[1] 44	147	138	93.9	25.7	17.4	63.3
E. C	[2] 44	90	84	93.3	15.6	14.0	50.9

[1] Air.

[2] Water.

In table 1, a comparison is made of the efficiency of the three presumptive media on the basis of the total number of gas-forming tubes which gave a positive result by the Completed Test. The results obtained from E. C. media at 44° C., air and water immersion, are included. The results at 45.5° C. are not included because at this temperature the number of positive tubes was less than one-fourth of those obtained with any of the three media when incubated at 37° C.

It is noted from this table that considering the results in the order given; (1) the number of gas-producing tubes decreased in order; 985 for standard lactose to 90 for E. C. at 44° C. water immersion; (2) the number of tubes completing decreased similarly from 529 to 84, with the exception of the slight variation between standard lactose and L. S. T. of 529 to 537; (3) the percentage of tubes completing increased in order from standard lactose, 53.7 percent; to E. C. at 44° C. air immersion, 93.9 percent; (4) in column 6 of this table the percentages of coliform group containing tubes are given, with a very marked indication for the use of 37° C. incubation and a slight superiority of L. S. T. over standard lactose broth. Based on the evidence presented in the table, L. S. T. was as productive for coliform group determinations as standard lactose and such results were accomplished with the confirmation of fewer tubes (985—842=143). Similarly E. C. at 37° C. produced 87.7 percent of the possible 100 tubes positive for members of the coliform group with the confirmation of 211 tubes less than required for L. S. T. The percentages of positives obtained from E. C. at 44° C., with either air or water immersion, are so few that this procedure is not eligible for consideration in coliform determinations.

However, E. C. medium was designed for the isolation of *Esch. coli*, not for the coliform group. In columns 7 and 8, the relative number of tubes containing *Esch. coli* are given, in column 7 expressed in percent and in column 8 expressed in percent of the maximum, taking the media (L. S. T.) showing the greatest number of tubes positive for *Esch. coli* as the maximum or 100 percent. From these results it is again noted that E. C. at 44° C., air and water immersion, recovered only 63.3 and 50.9 percent, respectively, of the numbers of *Esch. coli* proven to be present with L. S. T.

In table 2, a comparison is made of the productivity of these three media in determining organisms of the coliform group from most probable number estimations based on (1) the Completed Test, groups I, II, III, and IV and (2) brilliant green bile confirmation only, group V and VI. In preparing these average figures, all most probable numbers for a given sample were expressed in percent of the maximum M. P. N. That is, 100 percent was assigned for the medium producing the highest M. P. N. and results obtained with the other media expressed as the percent of the highest M. P. N. This procedure simplifies comparisons and eliminates the difficulties of averaging widely varying numbers.

It will be noted in group I, which includes all types of samples with incubation at 37° C., L. S. T. was slightly superior (2.3 percent) to standard lactose and E. C. was definitely inferior (26.4 percent). In group II, taps, wells and cisterns, Standard lactose was superior to L. S. T. (13.1 percent) and E. C. not as productive as L. S. T. In groups III and IV, including in the comparisons samples whose presumptive tubes were incubated at 44° C. and 45.5° C., L. S. T. was more productive in the former and standard lactose was more productive in the latter. The average productivity of E. C. at 44° C. and 45.5° C. air incubation is shown to be 30.0 and 6.7 percent respectively. In group V, where the results are shown of 52 samples whose presumptive tubes were confirmed in brilliant green lactose bile broth, standard lactose was slightly more productive than L. S. T. (3.3 percent) while E. C. at 37° C. failed by 27.4 percent. In group VI, giving the averages for samples whose presumptive tubes in E. C.

were also incubated at 44° C. and confirmed in brilliant green bile, L. S. T. was slightly more productive than standard lactose (7.6 percent), while E. C. at 44° C. again failed by about the same margin indicated for group III. Although the results obtained at 44° C. and at 45.5° C. incubation temperatures were always far below those obtained at 37° C., the results in air immersion incubators were always higher than those from water immersion incubation. The delay in reaching the high temperature incident to air immersion apparently enabled more of the organisms to survive the less favorable temperature.

TABLE 2.—*Comparison of efficiency of presumptive media for coliform determination on basis of most probable numbers*

Medium under test	Temperature of incubation (°C.)	Number of samples	Percent of maximum M. P. N.
GROUP I[1] ALL TYPES SAMPLES			
Standard	37	83	69.2
L. S. T.	37	83	71.5
E. C.	37	83	45.1
GROUP II[1] TAPS, WELLS, ETC.			
Standard	37	11	69.4
L. S. T.	37	11	56.3
E. C.	37	11	52.0
GROUP III[1] WITH 44° C. RESULTS			
Standard	37	8	74.9
L. S. T.	37	8	86.6
E. C.	37	8	73.7
E. C.	[2] 44	8	30.0
E. C.	[3] 44	8	19.3
GROUP IV[1] WITH 45.5° C. RESULTS			
Standard	37	4	86.4
L. S. T.	37	4	73.8
E. C.	37	4	24.8
E. C.	[2] 45.5	4	6.7
GROUP V[4] B. G. B. CONF.			
Standard	37	52	75.0
L. S. T.	37	52	71.7
E. C.	37	52	47.6
GROUP VI[4] B. G. B. CONF. 44° C.			
Standard	37	20	68.7
L. S. T.	37	20	76.3
E. C.	37	20	55.0
E. C.	[2] 44	20	26.6
E. C.	[3] 44	20	17.2

[1] Results of completed test, groups I, II, III, and IV. [2] Air. [3] Water.
[4] Brilliant green bile confirmation only in groups V and VI.

Comparison is now made of the relative productivity of these media in terms of *Esch. coli.* In obtaining the average M. P. N. values the results for each sample were expressed in terms of the percent of the maximum. From the results of the differential tests referred to above, obtained from cultures isolated by the Completed Tests, the percent of *Esch. coli*, *Aerobacter aerogenes* and intermediate strains isolated by each medium and test condition was calculated. By applying these percentages to the average M. P. N. for each medium the M. P. N. for *Esch. coli*, *A. aerogenes* and intermediate strains were obtained. These data are presented in table 3, comparing in group I, all results obtained with the three media at 37° C.; in group II all results of samples at 44° C., air and water immersion, as well as at 37° C.; and in group III results from samples incubated at 45.5° C., air and water immersion, and at 37° C.

TABLE 3.—*Comparison of most probable numbers of* Esch. coli A. aerogenes *and intermediate strains isolated by the three media under the conditions of tests*

GROUP I WITH 37° C. RESULTS

Medium under test	Temperature of incubation (°C.)	Number of samples	Percent of—			Percent of maximum M. P. N.	M. P. N. of—		
			Esch. coli	Aer. aerogenes	Intermediate strains		Esch. coli.	Aer. aerogenes	Intermediate strains
1	2	3	4	5	6	7	8	9	10
Standard	37	84	28.9	13.7	57.4	66.6	19.3	9.1	38.2
L. S. T	37	84	27.6	19.0	53.4	69.6	19.2	13.2	37.2
E. C	37	84	29.7	17.3	53.0	47.6	14.2	8.2	25.2
GROUP II WITH 44° C. RESULTS									
Standard	37	17	53.5	4.6	41.9	63.9	34.2	2.9	26.8
L. S. T	37	17	56.1	12.2	31.7	90.3	50.7	11.0	28.6
E. C	37	17	65.9	6.8	27.3	49.8	32.8	3.4	13.6
E. C	[1] 44	17	80.5	2.4	17.1	28.6	23.0	.7	4.9
E. C	[2] 44	17	90.7	2.3	7.0	21.6	19.6	.5	1.5
GROUP III WITH 45.5° C. RESULTS									
Standard	37	2	55.6	11.1	33.3	100.0	55.6	11.1	33.3
L. S. T	37	2	37.5	25.0	37.5	87.4	32.8	21.8	32.8
E. C	37	2	40.0	0	60.0	29.2	11.7	0	29.2
E. C	[1] 45.5	2	100.0	0	0	11.0	11.0	0	0
E. C	[2] 45.5	2	66.7	0	33.3	14.0	9.3	0	4.7

[1] Air. [2] Water.

In group I all of the results are in close agreement, with standard lactose and L. S. T. slightly higher. The E. C. media failed to produce as many positive tubes for members of the coliform group as standard lactose and L. S. T., but the respective percentages of *Esch. coli*, *A. aerogenes* and intermediate strains isolated from the three media were very similar.

Of the 67 samples examined at 37° C. and 44° C., air and water immersion, only 17 yielded determinant results. From these results (group II, table 3), it is noted that the percentage of *Esch. coli* recovered at 44° C. air and water immersion, is much greater than at 37° C. incubation with either of the 3 media. This would indicate, if the criterion for polluted water was to be based on *Esch. coli* rather than the coliform group, the use of E. C. medium at 44° C. might prove advantageous. However, it is noted also from table 3 column 7 of group II, that the M. P. N. of the 44° C. samples is much lower than the 37° C. results, and when these percentages are applied to determine the relative M. P. N. of *Esch. coli*, *A. aerogenes* and intermediate strains (columns 8, 9 and 10) it is apparent that the M. P. N. of *Esch. coli* at 44° C., either air or water immersion, is less than that obtained at 37° C. This is due probably to the failure of many members of the coliform group, aerogenes, intermediates, and coli to survive and grow at the higher temperature.

From the 37 samples incubated at 45.5° C., air and water immersion, as well as at 37° C. (group III, table 3) only 2 samples gave determinant results. Thus, it was quite apparent that 45° C. was too high a temperature for the growth or recovery of members of the coliform group, including *Esch. coli*. It was due to these results that the temperature was reduced to 44° C., air and water immersion, shortly after the study began. In this limited series no *A. aerogenes* were recovered from the E. C. media, either at 37° C. or 45.5° C., air and water immersion. The percentage of *A. aerogenes* recovered throughout the study is greater when standard lactose or L. S. T. was used. This fact again demonstrates the purpose of the E. C. medium, in that it was designed for the isolation of *Esch. coli* and not the coliform group. Unfortunately, it eliminates many *Esch. coli* also.

The results justify the following observations:

(1) Incubation of presumptive tubes of E. C. medium at 45.5° C. or even at 44° C. may not be expected to detect more than about 25 percent of the coliform group, or about 50 percent of the *Esch. coli* present in the samples.

(2) E. C. medium incubated at 37° C. invariably determined fewer coliforms, 12.3 to 61.6 percent (average 25.6 percent) less than either standard lactose broth or L. S. T. broth, although it did produce fewer false positive presumptives.

(3) L. S. T. broth produced about 16 percent fewer false positives than standard lactose broth and was superior to lactose broth in the detection of coliforms in 5 of the 8 comparisons made. This suggests that standard lactose broth might advantageously be replaced with L. S. T. broth, although it is desirable to have more results of similar comparative studies of high quality waters from other areas.

REFERENCES:

(*1*) Mallman, W. L., and Darby, C. W.: Use of a lauryl sulfate tryptose broth for the detection of coliform organisms. Am. J. Pub. Health. **31**:127 (1941).

(*2*) Hajna, A. A., and Perry, C. A.: Comparative study of presumptive and confirmative media for bacteria of the coliform group and for fecal streptococci. Am. J. Pub. Health. **33**:550 (1943).

(*3*) Perry, C. A., and Hajna, A. A.: Further evaluation of "E. C." medium for the isolation of coliform bacteria and Escherichia coli. Am. J. Pub. Health. **34**:735 (1944).

INCIDENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

January 4–31, 1948[1]

The accompanying table summarizes the incidence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in PUBLIC HEALTH REPORTS under the section "Incidence of Disease." The table gives the number of cases of these diseases for the 4 weeks ended January 31, 1948, the number reported for the corresponding period in 1947, and the median number for the years 1943–47.

DISEASES ABOVE MEDIAN INCIDENCE

Influenza.—For the 4 weeks ended January 31 there were 46,735 cases of influenza reported. During the corresponding 4 weeks in 1947 there were 16,910 cases reported and the median for the preceding 5 years (1943–47) was 17,421 cases. The incidence has been largely confined to the South Atlantic, South Central, and Far Western sections. Of the total cases, Texas reported 19,336, California 5,220, Arizona 4,828, South Carolina, 4,293, Virginia 3,635, Alabama 2,462, and Arkansas 2,076 cases. Almost 90 percent of the total cases were reported from those 7 States. Minor increases in other States in the South Central sections also contributed to the relatively high incidence in those sections; in the East South Central section the number of cases (3,252) was 2.6 times the median and in the West South Central section the number of cases (22,851) was 2.3 times the seasonal median expectancy. Few cases are being reported from the North Atlantic and North Central sections.

Measles.—There were 33,211 cases of measles reported for the current 4-week period as compared with 15,020 for the corresponding 4 weeks in 1947 and a 1943-47 median of 20,285 cases. Significant increases over the seasonal expectancy were reported from the Middle Atlantic, North Central, South Atlantic, West South Central, and Pacific sections while in the New England, East South Central, and Mountain sections the incidence was considerably below normal. For the country as a whole the current incidence was the highest since 1944 when approximately 50,000 cases were reported for the corresponding weeks.

Poliomyelitis.—While the number of cases (160) of poliomyelitis was only about 50 percent of the number reported for the corresponding period in 1947 it was 8 percent above the median for the preceding 5 years (1943–47). Of the total number of cases, New York reported 18, Washington 16, Idaho 14, California 13, Oregon 12, and North Carolina 11; more than one-half of the cases were reported from those 6 States. The South Atlantic and Mountain sections reported rather significant increases over the 1943–47 medians; in the Middle Atlantic and Pacific sections the increases were very slight, and all other sections reported a decrease from the normal seasonal median.

Whooping cough.—The number of cases of whooping cough (9,440) compared very favorably with the incidence for the corresponding weeks in 1947 and was only 1.1 times the 1943–47 median. The incidence was higher than the median for the preceding 5 years in the East North Central, West North Central, East South Central, and Mountain sections, and lower than the seasonal expectancy in the Atlantic Coast, East South Central, and Pacific sections.

---

[1] The data contained in these reports are based upon thirteen 4-week periods with the first week in each year ending between the 4th and the 10th of January.. This of necessity makes an extra week in an occasional year over a period of years, as was the case in 1947. The first week of the current 4-week period ended January 10, that being the first 7-day week in 1948.

DISEASES BELOW MEDIAN INCIDENCE

Diphtheria.—For the 4 weeks ended January 31 there were 979 cases of diphtheria reported. The number of cases was slightly less than 80 percent of the incidence for the corresponding period in 1947 and 72 percent of the median for the preceding 5 years (1,355 cases). For the country as a whole the current incidence was the lowest for this period since 1944 when 1,059 cases were reported for the corresponding 4 weeks. In the South Atlantic section the number of cases (267) was about 15 percent above the normal seasonal expectancy and in the Mountain section the number (85) was 35 percent above the preceding 5-year median; in all other sections the incidence was relatively low.

Meningococcus meningitis.—The number of cases (332) of meningococcus meningitis reported for the current 4-week period was only slightly below the number reported for the corresponding period in 1947, but it was less than 35 percent of the 1943–47 median. Each section of the country shared in the more favorable situation of this disease that now exists, the current incidence for the country as a whole being the lowest since 1942 when 230 cases were reported for the corresponding weeks.

Scarlet fever.—For the 4 weeks ended January 31 there were 8,457 cases of scarlet fever reported. There were 9,525 cases reported for the corresponding 4 weeks in 1947, with a 1943–47 median of 14,150 cases. Since 1944 this disease has been on the downward swing of a long-term cycle and for this particular period the incidence was the lowest on record. Decreases from the 5-year median in the various regions ranged from 30 percent in the East South Central section to about 60 percent each in the New England and Mountain sections.

Smallpox.—There were 11 cases of smallpox reported during the current 4-week period, as compared with 17 cases during the corresponding period in 1947 and a 5-year (1943–47) median of 34 cases. The number was the lowest on record for these same weeks. Two cases each were reported from Missouri and Kansas but no other State reported more than one case.

Typhoid and paratyphoid fever.—The incidence of these diseases continued at a relatively low level, the number of cases (153) reported for the 4 weeks ended January 31 being slightly below the record of last year and only about 75 percent of the median for the preceding 5 years. Slight increases over the normal seasonal expectancy were reported from the West South Central and Pacific regions of the country, but in the other 7 sections the numbers of cases were below the seasonal medians.

MORTALITY, ALL CAUSES

For the 4 weeks ended January 31 there were 42,190 deaths from all causes reported to the National Office of Vital Statistics by 93 large cities. The number of deaths was higher than the 1945–47 median for each week of the current 4-week period. The median number of deaths was 40,625 which is 3.7 percent less than the total deaths for the current 4 weeks.

Number of reported cases of 9 communicable diseases in the United States during the 4-week period Jan. 4–31, 1948, the number for the corresponding period in 1947, and the median number of cases reported for the corresponding period, 1943–47

Division	Current period	1947	5-year median	Current period	1947	5-year median	Current period	1947	5-year median
	Diphtheria			Influenza[1]			Measles		
United States	979	1,277	1,355	46,735	16,910	17,421	33,211	15,020	20,285
New England	23	95	44	14	73	147	1,324	3,834	3,336
Middle Atlantic	121	185	152	28	86	187	6,492	4,435	4,731
East North Central	105	168	168	473	223	571	12,848	2,054	3,786
West North Central	64	93	117	363	399	404	3,092	228	1,786
South Atlantic	267	229	229	8,800	5,530	6,163	2,307	2,324	1,498
East South Central	97	149	129	3,252	438	1,244	479	186	1,059
West South Central	146	180	309	22,851	8,804	9,774	3,248	425	788
Mountain	85	57	66	5,427	1,248	1,248	940	1,000	1,265
Pacific	71	121	158	5,527	109	365	2,481	534	1,881
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	332	344	953	160	315	147	8,457	9,525	14,150
New England	21	22	43	3	13	10	645	1,020	1,666
Middle Atlantic	56	61	205	28	27	27	1,902	2,228	2,732
East North Central	43	50	165	14	68	23	2,682	2,953	4,032
West North Central	22	37	79	8	37	13	788	813	1,445
South Atlantic	43	54	131	21	30	14	662	781	1,198
East South Central	31	43	91	7	18	10	414	365	581
West South Central	48	34	88	17	28	28	309	211	484
Mountain	11	11	25	21	20	13	359	445	929
Pacific	57	32	111	41	74	39	696	709	1,171
	Smallpox			Typhoid and paratyphoid fever			Whooping cough		
United States	11	17	34	153	166	201	9,440	9,500	8,985
New England	0	0	0	9	18	7	1,101	1,127	1,127
Middle Atlantic	0	0	0	24	28	28	1,261	2,328	2,029
East North Central	1	9	7	9	19	21	1,742	2,499	1,529
West North Central	4	2	3	3	10	9	730	272	426
South Atlantic	0	1	1	32	16	38	1,283	1,098	1,302
East South Central	1	2	6	12	20	14	308	369	346
West South Central	2	2	6	40	27	36	1,738	1,136	949
Mountain	3	1	9	5	14	14	713	174	323
Pacific	0	0	2	19	14	14	564	497	743

[1] New York, North Carolina, and Pennsylvania excluded; New York City and Philadelphia included.

DEATHS DURING WEEK ENDED JANUARY 31, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Jan. 31, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	10,421	9,602
Median for 3 prior years	10,069	
Total deaths, first 5 weeks of year	52,546	50,367
Deaths under 1 year of age	677	809
Median for 3 prior years	602	
Deaths under 1 year of age, first 5 weeks of year	3,619	4,187
Data from industrial insurance companies:		
Policies in force	66,906,452	67,288,191
Number of death claims	13,787	13,746
Death claims per 1,000 policies in force, annual rate	10.8	10.7
Death claims per 1,000 policies, first 5 weeks of year, annual rate	10.1	9.9

NOTFIABLE DISEASES, FOURTH QUARTER, 1947 [1]

The figures in the following table are the totals of the monthly morbidity reports received from the State health authorities for October, November, and December, 1947. These reports are preliminary and the figures are therefore more or less incomplete and subject to correction by final reports. In most instances they include cases reported in both civilian and military populations. The comparisons made are with similar preliminary reports; but, owing to population shifts in many States since the 1940 census, the figures for some States may not be comparable with those for prior years, especially for certain diseases. Each State health officer has been requested to included in the monthly report for his State all diseases that are required by law or regulation to be reported in the State, although some do not do so. The list of diseases required to be reported are not the same for each State. Only 11 of the common communicable diseases are notifiable in all the States. In some instances cases are reported, in some States, of diseases that are not required by law or regulation to be reported and the figures are included although manifestly incomplete. There are also variations among the States in the degree of, and checks on, the completeness of reporting of cases of the notifiable diseases; therefore, comparisons as between States may not be justified for certain diseases. As compared with the deaths, incomplete case reports are obvious for such diseases as malaria, pellagra, pneumonia, and tuberculosis, while in many States other diseases, such as puerperal septicemia, rheumatic fever, and Vincent's infection, are not reportable.

In spite of these known deficiencies, however, these monthly reports, which are published quarterly and annually in consolidated form, have proved of value in presenting early information regarding the reported incidence of a large group of diseases and in indicating trends by providing a comparison with similar preliminary figures for prior years. The table gives a general picture of the geographic distribution of certain diseases, as the States are arranged by geographic areas.

Leaders are used in the table to indicate that no case of the disease was reported.

Consolidated monthly State morbidity reports for October, November, and December, 1947

Division and State	Anthrax	Chickenpox	Conjunctivitis [2]	Diphtheria*	Dysentery, amebic	Dysentery, bacillary	Dysentery, undefined	Encephalitis, infectious	German measles	Hookworm disease	Influenza	Malaria [3]	Measles*	Meningitis, meningococcus*	Mumps	Ophthalmia [4]	Pellagra	Pneumonia, all forms
NEW ENGLAND																		
Maine	--------	696	--------	15	--------	2	--------	--------	28	--------	4	1	27	1	73	--------	--------	120
New Hampshire	1	134	--------	1	--------	--------	--------	--------	7	--------	33	--------	47	4	17	--------	--------	33
Vermont	--------	616	--------	11	--------	--------	--------	--------	27	--------	--------	--------	13	1	144	--------	--------	7
Massachusetts	1	2,742	48	76	--------	100	--------	--------	175	1	--------	16	732	12	2,102	116	--------	[5] 212
Rhode Island	--------	190	--------	9	--------	1	1	--------	2	--------	4	[6] 13	7	10	37	--------	--------	70
Connecticut	--------	1,369	1	1	3	--------	--------	1	46	1	13	5	79	17	221	1	--------	580
MIDDLE ATLANTIC																		
New York	8	3,408	3	193	122	41	--------	12	[7] 72	[7] 28	[7] 57	55	2,023	53	[7] 1,216	3	--------	3,014
New Jersey	4	2,409	--------	57	11	--------	--------	--------	147	--------	47	14	1,912	20	3,912	2	--------	905
Pennsylvania	5	3,401	--------	119	3	1	--------	7	--------	--------	26	9	1,051	65	2,288	3	1	1,041
EAST NORTH CENTRAL																		
Ohio	--------	2,956	1	208	4	1	10	--------	57	--------	40	3	1,227	45	435	102	--------	609
Indiana	--------	870	86	164	2	10	8	6	19	--------	132	6	292	6	200	--------	--------	138
Illinois	--------	2,448	132	57	52	20	--------	15	107	--------	35	14	4,044	34	2,114	--------	--------	1,036
Michigan	--------	2.756	56	40	46	9	--------	--------	128	7	43	15	6,041	20	1.633	2	--------	556

WEST NORTH CENTRAL																		
Minnesota		1,036		80	8	6	1			1	13	60	2,341	13				30
Iowa		633		32	3			10			5	4	481	12	378			11
Missouri		448		98			7	1	3		72	13	56	17	406			204
North Dakota		286		22	26			13			20		796	3				186
South Dakota		105		11								3	135		60			3
Nebraska		354		8	12			8			72	3	153	5	37			20
Kansas		1,072	2	51	1			5	28		111	2	107	6	173		1	176
SOUTH ATLANTIC																		
Delaware		53		1									20	3	24			10
Maryland		405		107	2	2	31	1	15		30	1	30	9	357			388
District of Columbia		91		4	1	9					3		94	6	34			239
Virginia		432		106	4		655	7			4,596	19	478	18	237		4	571
West Virginia		214		86				1	17		584		1,417	13	112			182
North Carolina				392	1	6		3				8	37	24				
South Carolina		193		272	18	57		2	23	334	5,389	970	68	5	280	7	156	930
Georgia		176	33	262	4	36				972	178	24	112	8	52		7	195
Florida		106	23	107	21	2	1		8	1,414	68	16	167	2	100	10	6	166
EAST SOUTH CENTRAL																		
Kentucky		297	1	170	3	1		2	7		19	8	38	16	100			305
Tennessee		252		142	7	10	15	3	16	4	378	33	183	14	43	5	9	498
Alabama		156		170	2			1	1		792	289	78	19	51		11	424
Mississippi		55		134	18	7		1		599	124	85	46	10	28	13	1	142
WEST SOUTH CENTRAL																		
Arkansas	2	303		102	105	34	63	1	5	1	808	[6] 190	123	5	52		2	173
Louisiana		23		67	26	2		5	4	129	510	64	154	7	13		1	405
Oklahoma	1	148		96	22	7	17	1	8	11	959	81	20	21	44	1	2	213
Texas		1,321		363	187	4,226	918				14,104	815	1,509	51	785	22	117	1,714
MOUNTAIN																		
Montana		662		29	1		1		15		95	2	1.126	1	680			45
Idaho		343	8	5					13		149		44		273			46
Wyoming		154	3	1	1			1	18				180	3	44			27
Colorado		1,577		77	3	6		2	14		472	3	211	10	1,117			225
New Mexico		106		27	9	22	21	1	6		11	1	20	2	27		3	164
Arizona		230	10	36	1	2	285	3	18		1,536	6	47	6	136	3	3	372
Utah		1,530		90	2		2	4	55		52	4	81	3	293			34
Nevada		116	15	1		3							14	1	95			13
PACIFIC																		
Washington	1	2,269	83	35	[8] 44	3	106	2	142		45	1	398	10	1,293			197
Oregon		693	29	30	7	3	1	5			253	3	178	14	458			255
California	2	5,436	9	174	48	96		19	586		728	25	2,320	65	3,251			[5] 366
Total	25	50,129	543	4,359	[8] 831	4,725	2,143	153	2.017	3,502	32,724	[6] 2,893	31.642	701	27,665	291	324	17,316
Fourth quarter 1946	12	61,310	224	4,922	945	4,798	1,352	124	1,793	3,681	38,519	6,694	22.639	849	19.665	381	799	21,730
Median 1942-46	12	63,810	190	5,723	867	5,898	1,897	138	2,598	3,863	38,579	10,192	25,449	1,357	25,042	380	815	28,746
Alaska		33		1			1				9		4	1	10			5
Hawaii Territory		86	1	3	7	10			38		5		21		543			[5] 7
Panama Canal Zone [9]		28		66	10	13						40	6	1	6			[10] 57

Consolidated monthly State moribidity reports for October, November, and December 1947—Continued

Division and State	Polio-myelitis*	Rabies in man	Rheumatic fever	Rocky Mountain spotted fever	Scarlet fever*	Septic sore throat	Small-pox*	Tetanus	Trachoma	Trichinosis	Tuberculosis, all forms*	Tuberculosis, respiratory	Tularemia	Typhoid fever*	Paratyphoid fever	Typhus fever endemic	Undulant fever*	Vincent's infection	Whooping cough*
NEW ENGLAND																			
Maine	10	-------	-------	-------	203	6	-------	1	-------	-------	110	105	-------	3	2	-------	7	9	284
New Hampshire	6	-------	-------	-------	[1] 32	29	-------	-------	-------	-------	31	-------	-------	-------	1	-------	2	27	104
Vermont	15	-------	-------	-------	31	1	-------	-------	-------	-------	42	-------	-------	1	1	-------	28	-------	638
Massachusetts	88	-------	-------	-------	1,054	19	-------	1	1	19	741	696	2	13	31	-------	10	-------	1,791
Rhode Island	[6] 13	-------	20	-------	89	4	-------	[6] 2	-------	1	141	135	-------	2	2	-------	9	2	326
Connecticut	27	-------	-------	-------	217	30	-------	4	-------	1	291	274	-------	9	2	-------	28	-------	967
MIDDLE ATLANTIC																			
New York	404	-------	-------	3	[11] 1,689	(12)	-------	9	-------	57	3,374	3,205	1	40	2	7	65	-------	2,377
New Jersey	70	1	-------	1	492	33	-------	2	-------	5	804	-------	3	18	4	-------	10	-------	1,689
Pennsylvania	160	-------	206	-------	1,318	-------	-------	2	1	2	1,189	-------	3	63	[13] 7	1	29	-------	2,030
EAST NORTH CENTRAL																			
Ohio	499	-------	13	2	2,259	16	3	1	-------	2	1,763	-------	4	11	3	-------	14	2	2,170
Indiana	78	-------	-------	-------	588	28	1	3	-------	-------	584	539	15	13	1	1	31	8	648
Illinois	184	-------	32	2	908	23	-------	7	3	1	2,366	2,252	24	23	1	-------	132	41	963
Michigan	182	-------	105	-------	1,024	51	-------	8	-------	1	1,554	-------	1	22	[13] 45	1	96	-------	1,986
Wisconsin	56	-------	-------	-------	492	-------	-------	-------	2	-------	563	-------	2	4	-------	-------	95	-------	1,689
WEST NORTH CENTRAL																			
Minnesota	52	-------	12	-------	598	64	-------	1	-------	-------	633	-------	-------	1	[13] 4	-------	58	-------	932
Iowa	62	-------	-------	1	434	2	-------	-------	-------	-------	178	-------	2	16	-------	-------	183	-------	233
Missouri	41	-------	9	1	232	19	2	-------	-------	-------	720	-------	17	26	3	-------	38	1	253
North Dakota	8	-------	2	-------	94	5	1	-------	2	-------	67	42	-------	-------	7	-------	1	1	203
South Dakota	16	-------	-------	-------	68	-------	2	-------	10	-------	66	-------	-------	4	-------	-------	15	1	60
Nebraska	47	-------	2	-------	210	-------	1	-------	-------	2	95	-------	-------	2	-------	-------	30	-------	136
Kansas	19	-------	1	-------	278	8	6	2	1	-------	235	226	8	3	1	1	27	39	339
SOUTH ATLANTIC																			
Delaware	9	-------	-------	-------	53	-------	-------	-------	-------	-------	55	55	-------	2	-------	-------	1	-------	40
Maryland	30	-------	13	2	221	14	-------	-------	-------	-------	621	601	8	15	2	-------	9	-------	887
District of Columbia	11	-------	-------	-------	114	-------	-------	-------	-------	-------	-------	-------	2	3	2	-------	-------	-------	195
Virginia	59	-------	-------	5	380	524	-------	8	-------	-------	984	977	14	52	11	7	13	-------	760
West Virginia	60	-------	4	-------	383	23	1	2	-------	-------	648	644	-------	14	-------	-------	6	-------	209
North Carolina	160	-------	-------	22	412	13	2	-------	-------	-------	873	846	15	9	2	8	6	-------	698
South Carolina	43	-------	98	-------	66	1,744	-------	2	-------	-------	93	-------	4	5	2	9	12	-------	917
Georgia	23	-------	15	4	253	48	-------	1	-------	-------	605	368	7	17	11	61	21	10	154
Florida	42	-------	-------	1	73	29	-------	4	-------	-------	1,054	1,054	3	23	[13] 20	41	16	45	216

EAST SOUTH CENTRAL																			
Kentucky	50	-	8	[6] 2	458	16	-	-	7	-	499	485	6	22	4	4	4	5	351
Tennessee	78	2	24	-	541	69	-	6	1	-	1,338	-	15	23	4	7	29	62	515
Alabama	8	1	-	-	178	-	-	11	-	-	670	-	8	5	-	28	18	-	332
Mississippi	25	1	-	-	87	-	-	-	-	-	424	412	13	5	-	17	11	-	50
WEST SOUTH CENTRAL																			
Arkansas	16	-	-	2	64	260	-	9	49	-	551	544	27	7	1	5	8	-	363
Louisiana	13	-	6	-	56	77	-	11	-	-	540	523	4	52	3	20	12	-	111
Oklahoma	17	-	-	10	133	56	-	3	99	-	526	521	11	12	57	1	28	2	165
Texas	30	-	-	-	445	447	-	-	16	-	1,602	-	13	63	3	99	86	-	2,681
MOUNTAIN																			
Montana	4	-	3	-	237	28	-	-	7	-	187	33	-	7	-	-	-	-	157
Idaho	230	-	8	-	96	46	-	-	-	-	33	-	-	4	1	-	5	7	169
Wyoming	3	-	-	-	46	16	-	-	-	-	12	-	4	4	-	-	-	2	76
Colorado	21	-	29	-	370	56	-	-	-	-	292	-	3	9	2	-	82	12	801
New Mexico	12	-	6	-	77	-	1	-	40	-	[14] 276	[14] 272	1	5	-	-	1	-	151
Arizona	10	-	-	-	85	-	-	-	102	-	573	564	-	14	2	1	1	-	266
Utah	19	-	15	-	101	21	-	-	-	-	13	13	9	2	-	-	29	-	119
Nevada	5	-	-	-	11	17	-	-	3	-	54	-	2	-	-	-	-	6	14
PACIFIC																			
Washington	70	-	80	-	481	33	-	1	-	-	577	-	-	5	3	-	17	278	370
Oregon	47	-	16	-	260	71	-	-	-	-	189	172	-	9	6	-	2	-	149
California	203	-	189	2	1,182	108	-	6	4	19	2,121	1,975	1	55	20	13	71	-	1,397
Total	[6] 3,335	5	916	[6] 60	19,273	4,054	20	107	348	110	30,957	17,533	252	717	[13] 273	332	1,396	560	32,131
Fourth quarter 1946	6,505	6	1,021	37	22,862	3,634	43	144	443	77	29,976	17,272	483	643	272	693	1,625	708	26,205
Median 1942-46	4,008	7	[15] 1,021	27	32,554	1,843	71	108	490	63	27,208	15,302	246	893	159	1,494	1,191	576	27,460
Alaska	-	-	-	-	1	13	-	-	-	-	642	642	-	2	-	-	-	-	3
Hawaii Territory	-	-	1	-	4	3	-	4	-	-	266	256	-	1	3	16	1	-	185
Panama Canal Zone [9]	2	-	-	-	-	-	-	-	-	-	[10] 21	-	-	2	2	2	-	-	[10] 1

See footnotes on p. 282.

Footnotes for tables on pp. 278, 279, 280, and 281

*Diseases marked with an asterisk (*) are reportable by law or regulation in all the States, including the District of Columbia. Typhoid fever is reportable in all the States; paratyphoid fever in all except 6 States. Syphilis is reportable in all the States and the District of Columbia but is not included in the table. Some States have increased and some have reduced the list of reportable diseases since the latest published compilation of reportable diseases (PUBLIC HEALTH REPORT 59:317-340) (Mar. 10, 1944. Reprint No. 2544).

[1] For reports for first, second, and third quarters of 1947 see pp. 890, 1372, and 1752 of the PUBLIC HEALTH REPORTS for June 13, Sept. 19, and Dec. 12, 1947, respectively.

[2] Includes cases of kerato- and suppurative conjunctivitis and of pink eye.

[3] In a few States practically all cases contracted outside the United States.

[4] Reported as ophthalmia neonatorum.

[5] Lobar pneumonia only.

[6] Includes delayed reports.

[7] New York City only.

[8] Includes 20 cases delayed reports.

[9] Includes the cities of Colon and Panama.

[10] In the Canal Zone only.

[11] Includes septic sore throat.

[12] Included in scarlet fever.

[13] Includes cases reported as salmonella infection.

[14] Includes nonresident cases.

[15] 3 year (1944-46) median.

The following list includes certain rare conditions, diseases of restricted geographical distribution, and those reportable in or reported by only a few States; last year's figures in parentheses (where no figures are given, no cases were reported last year):

Actinomycosis: Illinois 1, Minnesota 1 (3), Nevada 1.
Botulism: Maine 1, Kentucky 4, Colorado 1, Washington 4, Oregon 2.
Coccidioidomycosis: Arizona 2 (4), California 16 (12).
Dengue: South Carolina 2 (1), Texas 4 (7).
Diarrhea: New York 26 (45), New Jersey 5 (17), Pennsylvania 23 (28), Ohio 130 (120), includes enteritis, Illinois 8 (21), Michigan 5 (4), North Dakota 1 (1), Kansas 40, includes enteritis, Maryland 5 (31), South Carolina 1,831 (1,186), Florida 34 (12), Kentucky 36, Oklahoma 2, Colorado 1 (14), includes enteritis, New Mexico 68 (79), Oregon 3 (27), includes enteritis, California 32 (129).
Dog bite: Illinois (all animal bites) 2,638 (2,343), Michigan 1,624 (1,061), Arkansas (all animal bites) 125 (128).
Filariasis: Minnesota 1 (1).
Food poisoning: New Jersey 2 (2), Ohio 13 (3), Indiana 3 (5), Illinois 8 (23) Minnesota 54, Louisiana 6 (2), Idaho 1 (7), Colorado 2, Washington 55 (19), Oregon 12, California 166 (133).
Granuloma inguinale: Missouri 2 (6), West Virginia 2, Florida 72 (95), Tennessee 7 (20), Mississippi 71 (163), Louisiana 57 (59), California 3.
Impetigo contagiosa: Ohio 23 (6), Indiana 36 (43), Illinois 17 (10), Michigan 668 (697), Missouri 17 (2), North Dakota 2 (8), Nebraska 4, Kansas 14 (7), Kentucky 24 (13), Montana 9 (19), Idaho 19 (22), Wyoming 12 (14), Colorado 25 (2), Nevada 59 (57), Washington 521 (355), Oregon 1, Alaska 1, Hawaii Territory 37.
Jaundice (including hepatitis and Weil's disease): Maine 3 (15), New York 99 (153), Pennsylvania 23 (19), Illinois 9 (15), Michigan 7 (2), Minnesota 15 (6), South Carolina 8 (3), Florida 1 (8), Kentucky 4, Tennessee 8 (3), Idaho 6 (18), Utah 1 (1), Oregon 17 (31), California 39 (37), Hawaii Territory 2 (1).
Lead poisoning: California 1.
Leprosy: New York 4, Minnesota 1, Florida 2 (1), Mississippi 1, Louisiana 1 (1), Texas 2, California 1 (1), Hawaii Territory 6.
Lymphocytic choriomeningitis: Massachusetts 1 (2), Tennessee 4 (6).
Lymphogranuloma venereum: Missouri 2 (7), Florida 31 (45), Tennessee 15 (37), Louisiana 34 (15).
Psittacosis: Ohio 4, California 4 (3).
Puerperal septicemia: Tennessee 1.
Rabies in animals: New York 191 (318), Ohio 152 (161), Indiana 72, Illinois 16 (88), Michigan 55 (5), Minnesota 1, Kansas 13 (8), South Carolina 33 (33), Florida 110 (36), Alabama 88 (115), Arkansas 24 (37), Louisiana 6 (2), Texas 208 (214), Colorado 2 (3), Arizona 50 (delayed reports), Utah 1 (5) California 90 (76).
Rat bite fever: Tennessee 1.
Relapsing fever: Texas 15 (14), Nevada 3, California 5 (9), Panama Canal Zone 1.
Ringworm disease: Pennsylvania 1,149 (1,166), Ohio 29 (130), Illinois 346 (672), Michigan 638 (738), Minnesota 12 (4), Iowa 126, Missouri 12 (3), Kansas 7 (3), Kentucky 26, Montana 2, Idaho 20 (29), Utah 105, Washington 410 (267).
Scabies: Rhode Island 4 (2), Pennsylvania 134 (317), Ohio 53 (13), Indiana 3, Michigan 378 (499), Missouri 20 (23), North Dakota 9 (6), Kansas 39 (67), Kentucky 37 (17), Montana 24 (33), Idaho 59 (103), Wyoming 15 (5), Nevada 11 (5), Alaska 1.
Silicosis: New Mexico 2 (1).
Yaws: Kansas 1.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED FEBRUARY 7, 1948

Summary

The reported incidence of influenza declined from 14,253 to 12,896 cases for the current week, as compared with 3,432 for the corresponding week last year and 4,334 for the 5-year (1943–47) median. The decreases were reported chiefly in Alabama, California, and Arizona. Washington State, with a report of 300 cases (last week 19), was the only State reporting an increase of more than 99 cases. Seven States reporting an aggregate of 10,994 cases, or 85 percent (last week 91 percent) are as follows (last week's figures in parentheses): *Increases*—Virginia 1,016 (969), Arkansas 637 (599), Texas 5,133 (5,088); *decreases*—South Carolina 1,269 (1,279), Alabama 500 (1,576), Arizona 1,372 (1,666), California 1,067 (1,860). The total since the first of the year is 59,531, as compared with 20,342 for the corresponding period last year and a 5-year median of 21,748.

Of 28 cases of poliomyelitis reported (last week 32), 4 each occurred in North Carolina and Idaho, and 3 in California. The current total is lower than for any corresponding week of the past 3 years. For the corresponding week last year 59 cases were reported, and the 5-year median is 38. The total for the year to date is 187, as compared with 358 for the corresponding period last year and a 5-year median of 194.

Five cases of smallpox were reported (2 in Louisiana and 1 each in Indiana, Wisconsin, and Texas), making a total to date of 16 cases as compared with 23 for the same period last year and a 5-year median of 44. Two cases of anthrax were reported during the week—1 each in New York and New Jersey—and 1 case of leprosy, in California.

Deaths recorded during the week in 92 large cities in the United States totaled 10,584, as compared with 10,306 last week, 9,561 and 10,103, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1943–47) median of 9,845. The cumulative figure to date is 62,545, as compared with 59,370 for the same period in 1947. Infant deaths for the week totaled 741, as compared with 672 last week and a 3-year median of 633. The total to date is 4,326, as compared with 4,919 for the same weeks last year.

Telegraphic morbidity reports from State health officers for the week ended Feb. 7, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47
	Feb. 7, 1948	Feb. 1, 1947		Feb. 7, 1948	Feb. 1, 1947		Feb. 7, 1948	Feb. 1, 1947		Feb. 7, 1948	Feb. 1, 1947	
NEW ENGLAND												
Maine	0	0	0	2	2	------	5	174	29	1	1	1
New Hampshire	0	0	0	1	------	------	------	8	8	0	0	0
Vermont	0	0	0	------	38	32	2	223	97	2	1	0
Massachusetts	2	13	3	------	------	------	421	457	351	1	2	6
Rhode Island	1	0	0	------	------	------	1	125	20	2	0	0
Connecticut	1	0	1	------	1	8	32	226	155	0	0	2
MIDDLE ATLANTIC												
New York	10	30	21	[1] 2	[1] 9	[1] 12	827	151	745	9	10	25
New Jersey	8	2	2	------	6	18	878	120	156	3	7	7
Pennsylvania*	10	13	13	(2)	[2] 2	[2] 2	558	598	1,047	5	8	18
EAST NORTH CENTRAL												
Ohio	9	29	13	4	1	14	712	395	136	1	3	11
Indiana	19	9	12	56	5	21	475	20	140	2	1	4
Illinois	1	5	7	2	2	8	1,900	25	371	4	0	13
Michigan [3]	0	11	8	2	------	11	1,104	68	166	4	0	5
Wisconsin	0	2	2	135	32	84	311	107	107	1	0	3
WEST NORTH CENTRAL												
Minnesota	3	9	6	1	------	2	436	50	21	0	2	4
Iowa	3	3	3	9	------	------	620	9	32	0	1	1
Missouri	5	7	7	9	3	8	83	4	141	1	1	11
North Dakota	0	1	1	------	43	21	57	3	3	0	0	0
South Dakota	0	2	1	------	------	------	52	8	100	0	1	1
Nebraska	0	2	2	5	------	6	20	------	29	0	0	1
Kansas	1	4	6	36	7	11	10	7	258	0	0	1
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	55	1	7	0	0	0
Maryland [3]	3	6	6	2	2	17	60	13	41	0	2	6
District of Columbia	0	1	0	------	------	2	86	26	26	2	0	2
Virginia	6	8	12	1,016	430	660	109	164	201	0	4	7
West Virginia	7	2	5	137	39	92	359	125	61	2	1	2
North Carolina	15	5	11	------	------	------	7	236	96	1	2	10
South Carolina	6	5	5	1,269	633	659	21	57	57	1	0	5
Georgia	4	4	2	145	28	98	89	112	40	0	3	3
Florida	5	9	6	7	10	8	86	9	28	0	1	3
EAST SOUTH CENTRAL												
Kentucky	4	13	8	2	12	12	41	3	115	5	2	7
Tennessee	5	11	11	182	23	71	121	13	114	0	0	6
Alabama	5	8	8	500	149	215	19	9	13	1	1	5
Mississippi [3]	2	2	3	48	------	------	13	------	------	1	1	7
WEST SOUTH CENTRAL												
Arkansas	2	10	8	637	53	203	153	81	81	0	0	2
Louisiana	1	9	3	173	9	13	26	38	21	1	4	4
Oklahoma	9	3	6	222	83	117	47	7	20	1	1	1
Texas	24	23	43	5,133	1,519	2,259	1,367	80	199	2	6	13
MOUNTAIN												
Montana	13	0	0	29	21	21	120	230	163	0	1	0
Idaho	1	2	1	93	17	5	15	5	8	0	0	0
Wyoming	0	0	0	------	3	12	75	2	4	0	0	0
Colorado	8	3	6	57	48	93	70	34	100	0	1	1
New Mexico	3	3	2	3	6	2	3	29	7	1	0	0
Arizona	8	6	3	1,372	156	156	4	63	12	2	0	0
Utah [3]	3	0	0	99	12	12	13	8	35	0	0	1
Nevada	0	0	0	2	------	------	------	------	3	0	0	0
PACIFIC												
Washington	0	2	3	300	------	1	177	23	149	1	2	5
Oregon	10	3	5	137	16	32	29	30	58	1	0	3
California	10	22	35	1,067	12	84	538	85	426	7	10	17
Total	227	302	302	12,896	3,432	4,334	12,207	4,261	7,997	65	80	219
5 weeks	1,206	1,579	1,640	59,531	20,342	21,748	45,621	19,056	28,282	398	424	1,172
Seasonal low week [4]	(27th) July 5-11			(30th) July 26-Aug. 1			(35th) Aug. 30-Sept. 5			(37th) Sept. 13-19		
Total since low*	7,564	9,145	10,133	103,089	53,317	53,317	80,567	41,943	54,406	1,180	1,396	2,802

[1] New York City only.

[2] Philadelphia only.

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

*Report for Pennsylvania for week ended Jan. 31, 1948: Meningitis, meningococcus 6; diphtheria 7; dysentery, amebic 1; encephalitis, infectious 2; measles 553; poliomyelitis 2; scarlet fever 208; typhoid fever 6; undulant fever 4; whooping cough 133.

Telegraphic morbidity reports from State health officers for the week ended Feb. 7, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended— Feb. 7, 1948	Week ended— Feb. 1, 1947	Median 1943–47	Week ended— Feb. 7, 1948	Week ended— Feb. 1, 1947	Median 1943–47	Week ended— Feb. 7, 1948	Week ended— Feb. 1, 1947	Median 1943–47	Week ended— Feb. 7, 1948[5]	Week ended— Feb. 1, 1947	Median 1943–47
NEW ENGLAND												
Maine	0	1	0	21	40	40	0	0	0	0	0	0
New Hampshire	0	0	0	1	1	12	0	0	0	0	0	0
Vermont	0	2	0	9	10	12	0	0	0	0	0	0
Massachusetts	1	1	0	94	122	372	0	0	0	2	5	1
Rhode Island	0	0	0	5	14	16	0	0	0	0	0	0
Connecticut	0	0	0	42	71	85	0	0	0	2	0	0
MIDDLE ATLANTIC												
New York	2	8	3	239	343	439	0	0	0	1	4	3
New Jersey	1	1	0	70	132	132	0	0	0	0	0	1
Pennsylvania	0	1	1	183	187	309	0	0	0	2	2	2
EAST NORTH CENTRAL												
Ohio	0	1	0	273	402	329	0	2	0	6	2	2
Indiana	2	1	0	92	74	158	1	2	2	1	0	0
Illinois	0	3	1	159	158	216	0	0	1	0	1	1
Michigan [3]	0	4	0	112	148	148	0	0	0	3	0	2
Wisconsin	0	2	0	69	87	183	1	0	0	1	1	0
WEST NORTH CENTRAL												
Minnesota	2	0	1	49	42	76	0	0	0	0	0	0
Iowa	0	0	0	49	57	57	0	0	0	0	1	0
Missouri	0	3	1	37	43	109	0	0	0	0	0	1
North Dakota	0	0	0	8	10	11	0	0	0	0	0	0
South Dakota	0	0	0	2	1	20	0	0	0	0	0	0
Nebraska	2	1	0	20	31	45	0	1	1	0	0	0
Kansas	0	0	0	64	63	81	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	1	0	0	5	15	8	0	0	0	1	0	0
Maryland [3]	0	3	0	32	23	83	0	0	0	1	0	1
District of Columbia	0	1	0	13	4	21	0	0	0	0	0	0
Virginia	0	1	0	20	27	50	0	0	0	2	1	1
West Virginia	1	1	1	32	38	38	0	0	0	2	0	0
North Carolina	4	1	1	27	26	63	0	0	0	2	1	1
South Carolina	0	0	0	9	14	9	0	0	0	0	1	1
Georgia	0	0	0	17	20	20	0	0	0	1	2	3
Florida	1	4	4	18	5	13	0	0	0	2	3	0
EAST SOUTH CENTRAL												
Kentucky	0	0	0	53	61	61	0	0	0	0	2	0
Tennessee	1	1	1	36	36	36	0	1	0	2	1	1
Alabama	0	1	0	12	13	13	0	0	0	0	0	0
Mississippi [3]	0	1	1	3	7	12	0	0	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas	0	1	0	11	7	6	0	0	0	0	3	1
Louisiana	0	0	0	2	16	16	2	0	0	0	4	3
Oklahoma	0	1	1	14	4	18	0	0	0	0	5	0
Texas	1	2	2	37	39	86	1	0	2	1	2	3
MOUNTAIN												
Montana	2	0	0	6	10	11	0	0	0	0	0	0
Idaho	4	0	0	8	13	18	0	0	0	0	2	0
Wyoming	0	0	0	7	5	12	0	0	0	4	0	0
Colorado	0	1	0	25	40	52	0	0	0	0	0	0
New Mexico	0	0	0	10	9	9	0	0	0	1	0	1
Arizona	0	1	0	4	8	12	0	0	0	0	4	0
Utah [3]	0	0	0	26	21	66	0	0	0	0	0	0
Nevada	0	0	0	0	1	1	0	0	0	0	0	0
PACIFIC												
Washington	0	2	2	49	53	53	0	0	0	0	1	1
Oregon	0	0	0	26	27	27	0	0	0	1	4	1
California	3	8	6	94	127	231	0	0	0	5	1	5
Total	28	59	38	2,194	2,705	4,037	5	6	10	43	53	53
5 weeks	187	358	194	10,727	12,393	18,187	16	23	44	200	219	249
Seasonal low week [4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	10,398	25,155	13,585	33,266	39,079	56,508	37	77	127	3,609	3,747	4,861

---

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately as follows: Massachusetts 1 (salmonella infection); Michigan 1; North Carolina 1; Georgia 1; California 1.

Telegraphic morbidity reports from State health officers for the week ended Feb. 7, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended February 7, 1947							
	Week ended—		Median, 1943-47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Feb. 7, 1948	Feb. 1, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	48	8	18	------	------	------	------	------	------	------	------
New Hampshire	1	2	2	------	------	------	------	------	------	------	------
Vermont	52	15	19	------	1	------	------	------	------	------	------
Massachusetts	87	237	150	------	1	------	------	------	------	------	1
Rhode Island	8	11	19	------	------	------	------	------	------	------	------
Connecticut	21	60	53	------	------	------	------	------	------	------	1
MIDDLE ATLANTIC											
New York	143	178	226	8	10	------	------	------	------	------	5
New Jersey	64	186	133	------	------	------	2	------	------	------	------
Pennsylvania	101	232	219	------	1	------	------	------	------	------	3
EAST NORTH CENTRAL											
Ohio	84	142	139	------	------	------	------	------	2	------	3
Indiana	37	29	29	------	5	------	------	------	1	------	------
Illinois	68	111	75	3	------	------	1	------	3	------	7
Michigan [3]	93	200	102	7	------	------	------	------	1	------	2
Wisconsin	125	159	134	------	------	------	------	------	------	------	------
WEST NORTH CENTRAL											
Minnesota	40	21	27	------	------	------	------	------	------	------	2
Iowa	7	25	25	------	------	------	------	------	------	------	15
Missouri	24	25	15	------	------	------	------	------	2	------	------
North Dakota	22	------	2	3	------	------	------	------	------	------	------
South Dakota	7	1	1	------	------	------	------	------	------	------	1
Nebraska	7	7	6	------	------	------	------	------	------	------	2
Kansas	57	14	41	------	------	------	------	------	2	------	11
SOUTH ATLANTIC											
Delaware	3	16	5	------	------	------	------	------	------	------	------
Maryland [3]	26	71	43	------	------	4	1	------	------	------	2
District of Columbia	4	3	3	------	------	------	------	------	------	------	------
Virginia	75	79	79	------	------	64	1	------	2	------	------
West Virginia	23	15	25	------	------	------	------	------	------	------	------
North Carolina	50	35	122	------	------	------	------	------	1	------	1
South Carolina	113	45	52	------	2	------	------	------	------	------	2
Georgia	25	19	14	------	------	------	------	------	2	1	4
Florida	15	49	15	2	------	------	------	------	------	1	11
EAST SOUTH CENTRAL											
Kentucky	16	51	26	3	------	------	------	------	------	1	------
Tennessee	31	18	22	------	------	------	2	------	1	------	2
Alabama	27	100	25	------	------	------	------	------	------	------	1
Mississippi [3]	1	------	------	1	2	------	1	------	------	------	------
WEST SOUTH CENTRAL											
Arkansas	38	21	19	4	1	------	------	------	------	------	1
Louisiana	25	8	5	------	------	------	------	------	------	1	1
Oklahoma	20	4	10	------	------	2	------	------	------	------	2
Texas	307	219	188	20	219	87	------	------	------	5	5
MOUNTAIN											
Montana	11	3	9	------	------	------	------	------	------	------	------
Idaho	6	4	4	------	1	------	------	------	------	------	------
Wyoming	13	2	2	------	------	------	------	------	------	------	------
Colorado	76	11	24	------	------	------	------	------	------	------	4
New Mexico	22	14	16	------	------	------	------	------	------	------	------
Arizona	44	31	18	------	------	17	------	------	------	------	------
Utah [3]	28	3	23	------	------	------	------	------	------	------	4
Nevada	------	------	------	------	------	------	------	------	------	------	------
PACIFIC											
Washington	41	21	21	------	------	------	------	------	------	------	2
Oregon	13	1	12	1	1	------	------	------	------	------	2
California	80	117	117	9	7	------	2	------	------	------	1
Total	2,289	2,623	2,403	61	251	174	10	0	17	9	98
Same week: 1947	2,623	------	------	60	345	426	6	0	36	69	77
Median, 1943-47	2,403	------	------	23	326	88	10	0	20	51	[6] 77
5 weeks: 1948	11,727	------	------	293	1,639	1,428	36	3	118	89	488
1947	12,123	------	------	185	2,160	1,253	32	1	258	271	419
Median, 1943-47	11,388	------	------	138	1,748	692	42	1	122	271	[6] 354

[3] Period ended earlier than Saturday.
[6] 3-year median, 1945-47.

Anthrax: New York 1; New Jersey 1.
Leprosy: California 1.
Territory of Hawaii: Measles 1; poliomyelitis 1; whooping cough 9.

WEEKLY REPORTS FROM CITIES *

City reports for week ended Jan. 31, 1948

This table lists the reports from 90 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	-------	0	1	0	0	0	0	10
New Hampshire:												
Concord	0	0	------	0	-------	0	1	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	-------	0	0	0	0	0	0	------
Massachusetts:												
Boston	2	0	------	1	191	0	15	0	21	0	1	3
Fall River	0	0	------	0	-------	0	0	0	1	0	0	------
Springfield	0	0	------	0	-------	0	1	0	2	0	0	1
Worcester	0	0	------	0	-------	0	6	1	10	0	0	4
Rhode Island:												
Providence	0	0	------	0	-------	0	3	0	3	0	0	9
Connecticut:												
Bridgeport	0	0	------	0	-------	1	0	0	7	0	0	------
Hartford	0	0	------	0	1	0	0	0	0	0	0	10
New Haven	0	0	------	0	1	1	1	0	2	0	0	8
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	-------	0	7	0	7	0	0	8
New York	16	0	5	0	542	1	73	0	56	0	0	28
Rochester	0	0	------	1	-------	1	3	0	18	0	1	4
Syracuse	0	0	------	0	4	0	1	0	2	0	0	7
New Jersey:												
Camden	0	0	------	0	6	0	1	0	0	0	0	2
Newark	1	0	------	0	26	0	4	0	7	0	0	9
Trenton	2	0	1	0	4	0	1	0	4	0	0	------
Pennsylvania:												
Philadelphia	4	2	5	1	41	3	16	0	39	0	2	13
Reading	0	0	------	0	1	0	2	0	4	0	0	5
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	3	10	0	11	0	13	0	0	2
Cleveland	0	0	3	1	2	0	8	0	22	0	0	12
Columbus	2	0	1	1	112	0	2	0	4	0	1	1
Indiana:												
Fort Wayne	0	0	------	0	3	0	2	0	1	0	0	------
Indianapolis	1	0	2	2	80	1	4	0	15	0	0	3
South Bend	0	0	------	0	-------	0	0	0	2	0	0	1
Terre Haute	0	0	------	0	77	0	4	0	1	0	0	------
Illinois:												
Chicago	0	0	1	0	47	5	21	0	53	0	0	30
Springfield	0	0	------	0	130	0	1	0	3	0	0	3
Michigan:												
Detroit	1	0	------	0	38	1	23	1	64	0	0	17
Flint	0	0	------	0	-------	0	1	0	4	0	0	------
Grand Rapids	0	0	------	0	258	0	0	0	1	0	1	6
Wisconsin:												
Kenosha	0	0	------	0	50	0	0	0	1	0	0	1
Milwaukee	0	0	------	0	16	1	5	0	10	0	0	8
Racine	0	0	------	0	56	0	1	0	2	0	0	2
Superior	0	0	------	0	7	0	0	0	0	0	0	2
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	1	3	0	2	0	2	0	0	11
Minneapolis	2	0	------	0	95	0	7	0	14	0	0	8
St. Paul	1	0	------	0	21	0	5	0	3	0	0	14
Missouri:												
Kansas City	0	0	4	0	4	0	5	0	4	0	0	16
St. Joseph	0	0	------	0	-------	0	0	0	0	0	0	------
St. Louis	3	0	1	1	29	0	8	0	12	0	0	2
North Dakota:												
Fargo	0	0	------	0	-------	0	1	0	1	0	0	------
Nebraska:												
Omaha	0	0	------	0	6	0	3	0	4	0	0	2
Kansas:												
Topeka	0	0	------	0	-------	0	0	0	0	0	0	1
Wichita	0	0	------	0	1	0	3	0	0	0	0	4

*In some instances the figures include nonresident cases.

City reports for week ended Jan. 31, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	-----	0	25	0	2	0	2	0	0	------
Maryland:												
Baltimore	2	0	3	1	5	1	10	0	11	0	0	36
Cumberland	0	0	-----	0	-------	0	0	0	3	0	0	------
Frederick	0	0	-----	0	-------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	33	0	7	0	14	0	0	6
Virginia:												
Lynchburg	0	0	------	0	-------	0	2	0	0	0	0	1
Richmond	0	0	------	0	1	0	4	0	9	0	0	9
Roanoke	0	0	------	0	-------	0	0	0	0	0	0	------
West Virginia:												
Charleston	0	0	------	0	4	0	1	0	0	0	0	------
Wheeling	0	0	------	0	-------	0	0	0	2	0	0	------
North Carolina:												
Raleigh	0	0	-----	0	1	0	4	1	3	0	0	2
Wilmington	0	0	------	0	-------	0	1	0	1	0	0	1
Winston-Salem	0	0	------	0	3	0	3	2	1	0	0	------
South Carolina:												
Charleston	1	0	69	0	-------	0	1	0	0	0	0	2
Georgia:												
Atlanta	0	0	11	0	2	0	4	0	4	0	0	2
Brunswick	0	0	------	0	-------	0	0	0	0	0	0	----
Savannah	0	0	6	5	-------	0	1	0	3	0	0	1
Florida:												
Tampa	1	0	3	0	17	1	2	0	4	0	0	4
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	10	1	34	1	5	0	4	0	0	7
Nashville	1	0	------	1	-------	0	0	0	3	0	0	1
Alabama:												
Birmingham	0	0	11	1	6	0	8	0	2	0	0	2
Mobile	1	0	14	1	-------	1	2	0	1	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	9	0	1	0	1	0	1	0	0	2
Louisiana:												
New Orleans	1	0	3	0	2	0	0	1	4	0	0	1
Shreveport	0	0	------	0	-------	0	4	0	0	0	0	-----
Oklahoma:												
Oklahoma City	0	0	12	0	2	0	3	0	0	0	0	5
Texas:												
Dallas	2	0	------	0	1	0	2	0	4	0	0	7
Galveston	0	0	------	0	-------	0	2	0	0	0	0	----
Houston	1	0	----	0	27	0	1	0	1	0	0	5
San Antonio	2	0	3	2	4	1	9	0	1	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	2	0	0	0	0	0	0	2
Great Falls	0	0	------	0	-------	0	1	1	0	0	0	------
Helena	0	0	------	0	-------	0	0	0	0	0	0	------
Missoula	0	0	------	0	-------	0	1	0	1	0	0	------
Idaho:												
Boise	0	0	------	0	-------	0	1	0	2	0	0	7
Colorado:												
Denver	1	0	5	0	39	1	3	0	6	0	0	22
Pueblo	1	0	------	0	-------	0	2	0	1	0	0	9
Utah:												
Salt Lake City	0	0	----	0	4	0	1	0	6	0	0	6
PACIFIC												
Washington:												
Seattle	1	0	------	0	1	0	0	0	5	0	0	10
Spokane	0	0	------	0	0	0	1	0	2	0	0	0
Tacoma	1	0	------	0	46	0	0	0	4	0	0	3
California:												
Los Angeles	3	0	96	0	19	1	0	0	22	0	0	6
Sacramento	0	0	------	0	1	0	0	0	3	0	0	2
San Francisco	0	1	69	1	151	2	6	0	6	0	0	4
Total	54	3	347	25	2,293	24	348	7	555	0	6	432
Corresponding week, 1947 [1]	82	------	58	18	732	------	379	------	653	0	12	713
Average, 1943-47 [1]	78	------	452	[2] 39	[3] 2,801	------	[2] 464	------	1,199	1	11	676

[1] Exclusive of Oklahoma City.

[2] 3-year average, 1945-47.

[3] 5-year median, 1943-47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 90 cities in the preceding table (latest available estimated population, 34,013,800)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5.2	0.0	0.0	2.6	504	5.2	73.2	2.6	120	0.0	2.6	118
Middle Atlantic	11.3	1.0	5.4	1.0	306	2.4	52.9	0.0	67	0.0	1.5	37
East North Central	2.4	0.0	4.3	4.3	539	4.9	50.5	0.6	119	0.0	1.2	54
West North Central	11.9	0.0	9.9	4.0	316	0.0	67.6	0.0	80	0.0	0.0	115
South Atlantic	6.5	0.0	150.4	9.8	149	3.3	68.6	4.9	93	0.0	0.0	105
East South Central	11.8	0.0	206.6	23.6	236	11.8	88.5	0.0	59	0.0	0.0	59
West South Central	15.2	0.0	68.6	5.1	94	2.5	55.9	2.5	28	0.0	0.0	51
Mountain	15.9	0.0	39.7	0.0	357	7.9	71.5	7.9	127	0.0	0.0	365
Pacific	7.9	1.6	260.9	1.6	345	4.7	11.1	0.0	66	0.0	0.0	40
Total	8.3	0.5	53.3	3.8	352	3.7	53.5	1.1	85	0.0	0.9	66

Dysentery, amebic.—Cases: New York 3; Flint 1; St. Louis 1; Los Angeles 3.
Dysentery, bacillary.—Cases: Worcester 3; Los Angeles 2.
Dysentery, unspecified.—Cases: Chicago 1.
Leprosy.—Cases: New York 1.

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—December 1947.—During the month of December 1947, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Residence[1]									
	Panama City		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	10		1				1		12	
Diphtheria	23		2				2		27	
Dysentery:										
Amebic	4	1	1				5	1	10	2
Bacillary			4		1		3	1	8	1
Malaria[2]	1		1		6		261	6	269	6
Measles	2						6		8	
Mumps			1		5		2		8	
Pneumonia		4		4	28			9	[3] 28	17
Poliomyelitis					1				1	
Relapsing fever	1								1	
Tuberculosis		17		9	5	1		2	[3] 5	29
Typhoid fever	1								1	
Typhus fever					1				1	
Whooping cough					1				[3] 1	

---

[1] If place of infection is known, cases are so listed instead of by residence.

[2] 6 recurrent cases.

[3] Reported in the Canal Zone only.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended January 17, 1948.—During the week ended January 17, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		29	3	272	423	95	79	66	92	1,059
Diphtheria				18	4	2	2	1	2	29
Dysentery, amebic				2		1				3
Encephalitis, infectious								1		1
German measles				7	22			4	3	36
Influenza		9			1	1				11
Measles				746	626	8	3	35	68	1,486
Meninigitis, meningococcus		1		1	1		1	1		5
Mumps		39	3	279	204	32	102	38	39	736
Poliomyelitis					1	1	1			3
Scarlet fever		1	4	44	57	6	1	9	13	135
Tuberculosis (all forms)		6	11	98	30	11	8	8	122	294
Typhoid and paratyphoid fever		1		3	3					7
Undulant fever				3	1				1	5
Venereal diseases:										
Gonorrhea	1	4	7	116	87	23	30	48	77	393
Syphilis	2	10	2	57	48	13	4	6	18	160
Whooping cough		3		61	39	38	2	77	19	239

CUBA

Habana—Communicable diseases—5 weeks ended January 3, 1948.—During the 5 weeks ended January 3, 1948, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	39	2	Scarlet fever	1	
Malaria	6		Tuberculosis	6	1
Measles	6		Typhoid fever	14	1

Provinces—Notifiable diseases—5 weeks ended January 3, 1948.—During the 5 weeks ended January 3, 1948, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana[1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	2	3	11	15		20	51
Chickenpox		19			1		20
Diphtheria	1	46				5	52
Leprosy		3	1			5	9
Malaria	1	10	2	14	15	41	83
Measles		6		3	5	2	16
Scarlet fever		2					2
Tuberculosis	24	18	17	16	16	67	158
Typhoid fever	1	27	4	8	4	26	70
Whooping cough				19			19

[1] Includes the city of Habana.

NORWAY

Notifiable diseases—October 1947.—During the month of October 1947, cases of certain notifiable diseases were reported in Norway as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	13	Mumps	766
Diphtheria	86	Paratyphoid fever	3
Dysentery, unspecified	7	Pneumonia	1,343
Epidemic encephalitis	4	Poliomyelitis	79
Erysipelas	467	Rheumatic fever	162
Gastroenteritis	3,771	Scabies	4,424
Gonorrhea	666	Scarlet fever	491
Hepatitis, epidemic	242	Syphilis	141
Impetigo contagiosa	4,663	Tuberculosis (all forms)	409
Influenza	2,168	Typhoid fever	3
Laryngitis and bronchitis	10,082	Weil's disease	1
Measles	52	Whooping cough	590

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From consular reports, international health organizations, medical officers of the Public Health Service, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January-November 1947	December 1947	January 1948—week ended—				
				3	10	17	24	31
AFRICA								
Egypt	C	21,887	33	1	------	------	------	------
Alexandria	C	253	------	------	------	------	------	------
Cairo	C	133	------	1	------	------	------	------
Ismailiya	C	99	------	------	------	------	------	------
Port Said	C	37	------	------	------	------	------	------
Suez	C	26	------	------	------	------	------	------
ASIA								
Arabia: Amirate of Dubay	C	1	------	------	------	------	------	------
Burma	C	261	2	------	------	------	------	------
Moulmein	C	66	------	------	------	------	------	------
Rangoon	C	4	------	------	------	------	------	------
China:								
Anhwei Province	C	6	------	------	------	------	------	------
Chekiang Province	C	288	------	------	------	------	------	------
Pingyang	C	150	------	------	------	------	------	------
Wenchow	C	1	------	------	------	------	------	------
Formosa (Island of)	C	14	------	------	------	------	------	------
Fukien Province	C	16	------	------	------	------	------	------
Foochow	C	2	------	------	------	------	------	------
Honan Province	C	936	------	------	------	------	------	------
Hunan Province	C	16	------	------	------	------	------	------
Kiangsi Province	C	102	------	------	------	------	------	------
Kiangsu Province	C	738	------	------	------	------	------	------
Chinkiang	C	8	------	------	------	------	------	------
Shanghai	C	53	------	------	------	------	------	------
Tsingkiang	C	9	------	------	------	------	------	------
Kwangtung Province	C	6	------	------	------	------	------	------
Hong Kong	C	6	------	------	------	------	------	------
Suiyuan Province	C	52	------	------	------	------	------	------
Szechwan Province	C	5	------	------	------	------	------	------

See footnote at end of table.

CHOLERA—Continued

Place		January-November 1947	December 1947	January 1948—week ended— 3	10	17	24	31
India	C	141,752	9,496					
Ahmadabad	C	27						
Allahabad	C	70						
Bombay	C	114						
Calcutta	C	4,577	139	61	83	80	146	
Cawnpore	C	331	1					
Chittagong (See also Pakistan)	C	32						
Lahore	C	2,152	21					
Lucknow	C	288						
Madras	C	25	2	1		1		
Nagpur	C	38						
New Delhi	C	35						
India (French):								
Chandernagor	C	33						
Karikal	C	15						
Pondicherry	C	37						
India (Portuguese)	C	51						
Indochina (French):								
Annam	C	26	11					
Cambodia	C	1,140	33				[1] 206	
Cochinchina	C	526	15		[2] 8			
Bien Hoa	C	7						
Chaudoc	C	2	3		1			
Cholon	C	33						
Giadinh	C	11						
Longxuyen	C	33	3					
Mytho	C	6						
Rachgia	C	22						
Saigon	C	135	1			1		
Vinh-long	C	8						
Laos	C	55						
Tonkin	C	67						
Pakistan	C			443	348			
Chittagong	C			2		1		
Siam (Thailand)	C	3,445	6					
Bangkok	C	778	3					
Straits Settlements: Penang	C	[3] 1						
Syria	C		45	3				

[1] For the period Jan. 11-20, 1948.
[2] For the period Jan. 1-10, 1948.
[3] Imported.

PLAGUE

[C indicates cases; D, deaths]

AFRICA								
Belgian Congo	C	[1] 17	4			1	1	
British East Africa:								
Kenya	C	59	1	1				
Uganda	C	1						
Egypt: Alexandria	C	24						
Madagascar	C	[2] 223	53					
Mananjary	C	5						
Union of South Africa	C	[3] 34	[3] 8	3	1	[4] 2		
ASIA								
Burma	C	1,261	32	9	27		40	
Bassein	C	[5] 2						
Mandalay	C	17						
Rangoon	C	19			1	1	1	
China:								
Chekiang Province	C	141	9					
Formosa (Island of)	C	1						
Fukien Province	C	751	6					
Amoy	C	13						
Foochow	C	49						
Kiangsi Province	C	289	116					
Nanchang	C	46	P					
Kiangsu Province	C	30						
Shanghai	C	28						
Kwangtung Province	C	77						
Yunnan Province	C	[6] 780						
India	C	73,235	2,412					
Indochina (French):								
Annam	C	86	3					
Cambodia	C		1					
Cochinchina	C	31						
Laos State	C		2					

See footnote at end of table.

PLAGUE—Continued

Place		January-November 1947	December 1947	January 1948—week ended— 3	10	17	24	31
Java	C	39						
Korea	C	22						
Manchuria	D	[7] 100						
Palestine	C	42	1					
Siam (Thailand)	C	50	17	13	5	15		
Syria	C	6						
Turkey: Akcakale	C	19						
EUROPE								
Germany: East Prussia.[8]								
Portugal: Azores	C	4						
Turkey (see Turkey in Asia).								
NORTH AMERICA								
Canada.[9]								
SOUTH AMERICA								
Argentina:								
Cordoba Province	C	1						
Santa Fe Province	C	3						
Brazil: [10]								
Alagoas State	C	1						
Ceara State	C	2						
Minas Geraes State	C	7						
Parahyba State	C	4						
Pernambuco State	C	9						
Ecuador:								
Chimborazo Province	C	4	1					
Loja Province	C	22						
Peru:								
Ancash Department	C	1						
Lambayeque Department	C	10						
Libertad Department	C	20						
Lima Department	C	49					1	
Piura Department	C	[11] 79						
OCEANIA								
Hawaii Territory: Plague infected rats [12]		3						[13] 4

[1] Includes 5 cases of pneumonic plague.

[2] Includes 64 cases of pneumonic plague.

[3] Includes 2 cases of pneumonic plague.

[4] Pneumonic.

[5] Imported.

[6] Includes 12 cases of pneumonic plague.

[7] Period not specified.

[8] During the month of June 1947, an outbreak of plague with high mortality occurred in Königsberg, East Prussia, Germany.

[9] For the period July 5 to Sept. 20, 1947, 6 lots of plague infected fleas from squirrels were reported in Alberta and Saskatchewan Provinces, Canada.

[10] In addition, 7 cases of plague were reported in Brazil for the period Jan. 1 to May 31, 1947, specific localities not being given.

[11] In addition 82 cases with 65 deaths in Ayabaca Province and 58 cases with 48 deaths in Huancabamba Province, all unconfirmed, were reported for the period September 1946 to March 1947.

[12] Plague infection was also reported in Hawaii Territory as follows: On Jan. 9, 1947, in a pool of 31 rats, on Mar. 20, 1947, in a pool of 32 fleas collected from 59 rats.

[13] Includes 1 mouse; date of report, Jan. 29, 1948.

SMALLPOX

[C indicates cases; P, present]

AFRICA								
Algeria	C	164						
Angola	C	265						
Basutoland	C	1						
Bechuanaland	C	38						
Belgian Congo	C	[1] 2,466	[1] 107	[1] 50				
British East Africa:								
Kenya	C	459	10					2
Nyasaland	C	1,847	253					
Tanganyika	C	2,703	103	25				
Uganda	C	566	48	1	8			
Cameroon (French)	C	139						
Dahomey	C	150	11		1		1	
Egypt	C	487	9					
Ethiopia	C	32						
French Equatorial Africa	C	12						
French Guinea	C	427						

See footnote at end of table.

SMALLPOX—Continued

Place		January-November 1947	December 1947	January 1948—week ended— 3	10	17	24	31
Gambia	C	6			4			
Gold Coast	C	886	83	11				
Ivory Coast	C	2,716	197		57		24	
Liberia	C	37						
Libya	C	2,251	46	3	23		6	
Mauritania	C	23						
Morocco (French)	C	57	4		1			
Morocco (Int. Zone)	C	12						
Morocco (Spanish)	C	29	1					
Mozambique	C	3	25	1	5			
Nigeria	C	4,935						
Niger Territory	C	2,576	109					
Portuguese Guinea	C	3						
Rhodesia:								
Northern	C	78	9	17		17	4	
Southern	C	557						
Senegal	C	17						
Sierra Leone	C	387						
Sudan (Anglo-Egyptian)	C	716	224	47	25	50		
Sudan (French)	C	393	2					
Swaziland	C	10						
Togo (French)	C	87	1					
Tunisia	C	1,016	109					
Union of South Africa	C	503	P					
ASIA								
Arabia	C	1						
Burma	C	2,833	47	14	12		81	
Ceylon	C	1						
China	C	3,090	304	62	78	45	67	
India	C	49,255	4,545					
India (French)	C	10						
India (Portuguese)	C	12						
Indochina (French)	C	4,637	268				[2] 403	
Iran	C	246	143	30	19			
Iraq	C	41	26			3	1	
Japan	C	390	1	1				
Korea	C	125						
Lebanon	C	1	21	8	20			
Malay States (Federated)	C	3,947	213	73				
Manchuria	C	8						
Netherland East Indies	C	4						
Pakistan	C			372	464			
Palestine	C					1	2	
Portuguese Timor	C	32						
Siam (Thailand)	C	1,351	18	11				
Straits Settlements	C	99						
Syria	C	5	22	10	1			
Turkey (see Turkey in Europe).								
EUROPE								
Belgium	C	[1] 23						
France	C	48						
Germany	C	12						
Great Britain: England and Wales	C	77						
Greece	C	10						
Irish Free State	C	[3] 1						
Italy	C	68						
Luxemburg	C	[1] 2						
Portugal	C	183	33	8	2	7		
Spain	C	31	1					
Switzerland	C	[3] 1						
Turkey	C	3						
NORTH AMERICA								
Guatemala	C	12						
Mexico	C	1,072						
Panama (Republic)	C	[3] 1						
SOUTH AMERICA								
Argentina	C	38						
Brazil	C	488						
Colombia	C	3,439	230					
Ecuador	C	[1] 2,446	[1] 557					
Paraguay	C	[1] 1,132						
Peru	C	397						
Uruguay	C	[1] 319						
Venezuela	C	[1] 5,266	[1] 99	[1] 30	[1] 9	[1] 148	[1] 208	

---

[1] Includes alastrim.

[2] For the period Jan. 1-20, 1948.

[3] Imported.

TYPHUS FEVER*

[C indicates cases; P, present]

Place		January-November 1947	December 1947	January 1948—week ended—				
				3	10	17	24	31
AFRICA								
Algeria	C	197	------	------	------	------	------	------
Basutoland	C	15	------	------	------	------	------	------
Bechuanaland	C	1	------	------	------	------	------	------
Belgian Congo	C	371	11	------	------	------	------	------
British East Africa:								
Kenya [1]	C	29	------	------	------	------	------	------
Uganda	C	2	------	------	------	------	------	------
Egypt	C	130	8	------	------	------	------	------
Eritrea	C	693	54	------	------	------	------	------
Ethiopia	C	353	------	------	------	------	------	------
French West Africa [2]	C	2	------	------	------	------	------	------
Gold Coast	C	6	------	------	------	------	------	------
Libya	C	316	13	7	5	------	8	------
Morocco (French)	C	125	3	------	1	------	------	------
Morocco (International Zone)	C	27	------	------	------	------	------	------
Morocco (Spanish)	C	88	------	------	------	------	------	------
Nigeria [1]	C	18	------	------	------	------	------	------
Rhodesia:								
Northern	C	1	------	------	------	------	------	------
Southern	C	1	------	------	------	------	------	------
Senegal	C	2	------	------	------	------	------	------
Sierra Leone	C	3	------	------	------	------	------	------
Sudan (Anglo-Egyptian)	C	1	------	------	------	------	------	------
Tunisia [1]	C	663	25	------	------	------	------	------
Union of South Africa [1]	C	283	P	------	P	------	------	------
ASIA								
Arabia [1]	C	2	------	------	------	------	------	------
Burma	C	3	------	------	------	------	------	------
Ceylon	C	3	------	------	------	------	------	------
China [1,3]	C	94	7	------	------	1	------	------
India	C	7	------	------	------	------	------	------
Indochina (French)	C	76	3	------	1	------	------	------
Iran	C	256	7	3	2	------	------	------
Iraq	C	294	11	2	------	7	2	------
Japan	C	1,035	80	2	------	------	------	------
Java	C	1	------	------	------	------	------	------
Korea	C	1,261	------	------	------	------	------	------
Malay States (Federated) [1]	C	50	------	------	------	------	------	------
Manchuria	C	12	------	------	------	------	------	------
Palestine [1]	C	226	3	------	------	------	------	------
Siam (Thailand)	C	4	------	------	------	------	------	------
Straits Settlements [1]	C	10	1	------	------	------	------	------
Syria [1]	C	32	1	1	------	------	------	------
Trans-Jordan	C	20	------	3	------	------	4	------
Turkey (see Turkey in Europe).								
EUROPE								
Austria [1]	C	8	------	------	------	------	------	------
Bulgaria	C	849	30	------	------	------	------	------
Czechoslovakia	C	41	2	------	------	------	------	------
France	C	4	------	------	------	------	------	------
Germany	C	25	2	------	1	------	------	------
Great Britain: Malta and Gozo [2]	C	24	1	------	------	------	------	------
Greece [1]	C	371	25	3	2	3	5	10
Hungary	C	599	5	1	------	7	7	------
Italy	C	72	------	------	------	------	------	------
Sicily	C	33	------	------	------	------	------	------
Luxemburg	C	4	1	2	------	------	------	------
Netherlands [1]	C	3	------	------	------	------	------	------
Norway [2]	C	1	------	------	------	------	------	------
Poland	C	509	18	------	------	------	------	------
Portugal	C	4	------	------	------	------	------	------
Rumania [1]	C	24,461	------	------	------	------	------	------
Spain	C	184	4	------	------	------	------	------
Switzerland [2]	C	6	------	------	------	------	------	------
Turkey	C	605	53	10	5	17	8	------
Yugoslavia	C	203	12	5	9	------	------	------

See footnote at end of table.

TYPHUS FEVER—Continued

Place		January-November 1947	December 1947	January 1948—week ended—				
				3	10	17	24	31
NORTH AMERICA								
Costa Rica [2]	C	101			1			
Cuba [2]	C	11						
Guatemala	C	316						
Jamaica [2]	C	41	1					
Mexico	C	1,788						
Nicaragua	C	2						
Panama Canal Zone	C	13	1					
Panama (Republic)	C	[4] 22						
Puerto Rico [2]	C	52	5					
Virgin Islands [2]	C	2						
SOUTH AMERICA								
Argentina [1]	C	16						
Brazil	C	48	19					
Chile [1]	C	439						
Colombia	C	2,024	99					
Curacao [2]	C	1						
Ecuador [1]	C	574	32					
Peru	C	1,241						
Venezuela [1]	C	193						
OCEANIA								
Australia [2]	C	163	8					
Hawaii Territory [2]	C	42	4					

*Reports from some areas are probably murine type, while others probably include both murine and louse-borne types.

[1] Includes murine type.

[2] Murine type.

[3] Information dated December 10, 1947, stated that 100 deaths from typhus fever daily had occurred in Sinkian Province, China, and spreading in Tihwa.

[4] Includes imported cases.

YELLOW FEVER

[C indicates cases; D, deaths]

AFRICA								
Belgian Congo: Orientale Province	C	1				1		
Nigeria: Ossiomo leper settlement	C		[1] 1					
Sudan (French): Bamako	C	3						
SOUTH AMERICA								
Brazil:								
Bahia State	D	1						
Para State	D	1						
Colombia:								
Antioquia Department	C	[2] 8						
Boyaca Department	D	4						
Caldas Department	D	8	1					
Cundinamarca Department	D	2						
Intendencia of Meta	D	9	1					
North Santander Department	D	1						
Santander Department	D	29						
Tolima Department	D	3						
Peru: Huanuco Department	D	2						

[1] Suspected.

[2] Includes deaths used as cases.

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. : 1948

For sale by the Superintendent of Documents, United States Government Printing Office Washington 25, D. C.

Price 10 cents. Subscription price $4.00 a year.

U. S. GOVERNMENT PRINTING OFFICE: 1948

Public Health Reports

VOLUME 63 MARCH 5, 1948 NUMBER 10

TUBERCULOSIS CONTROL ISSUE NO. 25

IN THIS ISSUE

Editorial—Approaches to Case Finding

Ten Proved Cases of Histoplasmosis

New British Classifications for Tuberculosis

U.S. PUBLIC HEALTH SERVICE
1798

CONTENTS

Page

Editorial—Approaches to case finding. Francis J. Weber ---------- 297

A report of ten proved cases of histoplasmosis. Ivan L. Bunnell and Michael L. Furcolow ---------- 299

New official classifications for tuberculosis in Great Britain ---------- 316

INCIDENCE OF DISEASE

United States:

- Reports from States for week ended February 14, 1948, and comparison with former years ---------- 320
- Weekly reports from cities:
  - City reports for week ended February 7, 1948 ---------- 324
  - Rates, by geographic divisions, for a group of selected cities ---------- 326
- Territories and possessions:
  - Puerto Rico—Notifiable diseases—4 weeks ended January 31, 1948 ---------- 326

Foreign reports:

- Canada—Provinces—Communicable diseases—Week ended January 24, 1948 ---------- 327
- Mexico—Mexicali—Cerebrospinal meningitis ---------- 327
- Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—
  - Plague ---------- 327
  - Smallpox ---------- 328

Deaths during week ended February 7, 1948 ---------- 328

Public Health Reports

Vol. 63 • MARCH 5, 1948 • *No. 10**

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

EDITORIAL

APPROACHES TO CASE FINDING

Case finding has long been considered one of the most significant techniques of tuberculosis control. Within recent years, the efforts of voluntary and official agencies have succeeded in engendering such widespread popular interest in mass case finding that it has been possible to contemplate its nation-wide acceleration. As in the past, the program will be approached entirely on the basis of voluntary participation.

With the enactment of recent legislation in Alabama, however, we may observe a departure from the voluntary approach to mass case finding. On August 6 last, the Governor of Alabama signed into law an Act requiring that all residents of the State between the ages of 13 and 50 submit to examination for tuberculosis. Furthermore, the law imposes fines for noncompliance. As an example of health legislation, this statute must be viewed with more than casual interest, for this is the first time in the history of the Nation that mass case finding has been placed under the force of State law.

Beyond its intrinsic interest as health legislation at the State level, we find implicit in the Alabama program the entire question of compulsory and voluntary approaches to health problems. There can be little doubt that some problems of disease control require the force of law. In the matter of the isolation of open, infectious cases of tuberculosis, for example, there is now little controversy. The fact that isolation here is so overwhelmingly in the public interest renders entirely defensible the use of legal compulsion. Despite the fact that this has long been recognized by epidemiologists, the public was slow to acknowledge it, and positive action resulted only after public enlightenment had led to the conviction that legal measures were indeed imperative. Today, we find that most States specifically require the isolation of infectious tuberculosis, forcible if necessary, in the interest of public health and safety.

---

* This is the twenty-fifth of a series of special issues of PUBLIC HEALTH REPORTS devoted exclusively to tuberculosis control, which will appear the first week of each month. The series began with the Mar. 1, 1946 issue. The articles in these special issues are reprinted as extracts from the PUBLIC HEALTH REPORTS. Effective with the July 5, 1946, issue, these extracts may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 10 cents a single copy. Subscriptions are obtainable at $1.00 per year; $1.25 foreign.

In case finding, on the other hand, it has been found that the voluntary approach to community-wide surveys can be so effective that well over 80 percent of an eligible population group can be studied in a relatively short period of time. Such results have been assured, however, only through effective community organization and action. Indeed, the public's desire to participate in case finding has reached such proportions that the nation-wide potentialities of the program are limited only by the funds and personnel available for the work. Although much already has been accomplished there is still a shortage of the tools necessary to achieve nation-wide coverage. Assuredly, the effective operation of any law which envisions the mass surveying of large population groups must contend with these same deficiencies.

It is not our function, however, to conjecture the administrative problems which may confront the operation of the Alabama program. Nor is it within our province now to inquire into the desirability of such legislation generally. More important, the people of Alabama have, in the passage of this legislation, recognized that tuberculosis goes all too frequently undetected, and have taken legal recourse to search out the hidden cases which are the chief carriers of the disease.

"Human nature," observed Ralph Waldo Emerson, "expresses itself in laws as characteristically as in statues, or songs, or railroads; and an abstract of the codes of nations would be an abstract of the common conscience." If this be true, and there is indeed little doubt of it, the enactment of the type of health legislation here under discussion bears added witness to the public conviction that direct action, voluntary or compulsory, is necessary if man is ultimately to provide a safe and healthful environment for himself, his family, and his fellows.

FRANCIS J. WEBER, *Medical Director,*
Chief, Tuberculosis Control Division.

A REPORT ON TEN PROVED CASES OF HISTOPLASMOSIS[1]

By Ivan L. Bunnell, *Senior Assistant Surgeon, and* Michael L. Furcolow, *Surgeon, United States Public Health Service*

Histoplasmosis has been considered a rare, uniformly fatal disease. Only 74 cases had been reported by January 1945 (*1*) and at the present time the total number of cases reported is less than 100. The true prevalence of the disease is unknown, but it is suspected that the disease in some form occurs more frequently than the number of reported cases would indicate; a mild, nonfatal form of histoplasmosis may be widely prevalent (*2*, *3*). Furthermore, whenever intensive search for the disease has been made, a marked increase in the number of reported cases has resulted. This occurred in Ann Arbor (*1*), Nashville (*4*), and is now true in Kansas City.

The present article reports 10 proved cases of histoplasmosis found in the Kansas City area. These cases illustrate the fact that histoplasmosis varies from a mild infection with subclinical manifestations to the previously recognized acute, fatal illness. That 9 of these 10 cases were diagnosed within a period of 9 months supports the view that such infection is not a rare occurrence.

Histoplasmin and tuberculin skin-test data and complement fixation test results are reported for each patient. In addition, cultural and animal inoculation studies for pathogenic fungi and tubercle bacilli are reported for 9 of the 10 patients.

MATERIAL AND METHODS

During the last 2½ years, a large group of persons has been studied by the authors. These patients were selected during routine skin-test and X-ray surveys in public schools, found on hospital wards, or referred for study by private physicians because histoplasmosis was suspected.

Preliminary procedures included chest X-rays and skin tests with tuberculin and histoplasmin. As a result of these screening tests, a number of persons was selected for whom the diagnosis of histoplasmosis remained a possibility. These patients were studied further by cultural and serologic methods and the possibility of the diagnosis of active histoplasmosis was eliminated for the majority. There remained a group of patients in whom active histoplasmosis was suspected on the basis of radiologic (*5*) or serologic (*6*) evidence. Among these suspects the diagnosis of histoplasmosis was established in 10 cases.

All 10 of these cases were studied in hospitals. Routine admission physical examinations and laboratory work (complete blood count, urinalysis, chest X-ray) were done on all patients. In addition, the following specific diagnostic procedures were employed:

---

[1] From the Office of Field Studies, Tuberculosis Control Division.

Skin tests.—All patients were skin-tested with tuberculin (PPD–S 0.0001 mg.) and histoplasmin (H–15, 1:1000). All but case 10 were tested with blastomycin (B–7, 1:1000). The fungus antigens were prepared and titrated for potency in infected animals according to the method outlined by Howell (*7*). In addition, extracts of *Candida albicans*, *Haplosporangium parvum*, *Trichophyton mentagraphytes*, *Actinomyces bovis*, *Aspergillus fumigatus*, *A. clavatus*, *A. terreus*, and *Alternaria* were used on cases 1, 2, 3, and 7. These extracts were prepared by Dr. Arden Howell and Assistant Sanitarian (R) Forrest W. Cross and were employed in a dilution of 1:1000. Coccidioidin (1:100) used in cases 1, 2, 3, 7, and 8, was furnished by Dr. Charles B. Smith of San Francisco.

All tests were made by the intracutaneous method, employing 0.1 cc. of the appropriate solution. Readings were taken at 48 hours. A reaction in which the induration measured 5 mm. or more in diameter was considered positive.

Complement fixation tests.—These tests were performed on serum from each patient, using histoplasmin and blastomycin as antigens (*8*). When antibodies to both these antigens were present, the serum was diluted in successive tests to determine which antibody was present in higher concentration.

Cultures.—Employing both synthetic media and animal inoculation, a thorough search was made for tubercle bacilli and pathogenic fungi in material from these patients. Sputum, gastric washings, blood, bone marrow, biopsy and autopsy tissues were utilized. Smears, cultures and guinea pig inoculations were employed to demonstrate tubercle bacilli; Petrik's and Petragnani's media were used as culture media. Culture and mouse inoculation were used to demonstrate pathogenic fungi; potato dextrose and brain-heart-infusion blood agar were the fungus culture media. Twenty units of penicillin and 40 units of streptomycin were added to each ml. of fungus media (*9*), and cultures were incubated at both 25° and 37° C.

CASE REPORTS

Mild Illness, With Recovery

Case 1, C. D.,[3] white male, age 13 years. The patient had been a resident of Kansas City, Mo., for 4 years, having previously lived 1½ years in Illinois, and before that, 4 years in Oklahoma and 4 years in Texas. He was selected for study because of widespread miliary lung lesions detected on a chest X-ray in February 1945 taken as part of a skin test and X-ray survey of school children of Kansas City, Mo. He was a nonreactor to tuberculin.

---

[3] Studied in cooperation with Dr. Herbert L. Mantz of Kansas City, Mo.

History.—The patient was a supposedly healthy school child. In response to questioning, he reported malaise and headaches for 3 months.

Admission findings.—First admission, April 1945: During the first 7 days, a low-grade afternoon fever was noted (seldom exceeding 100°, but once up to 101°). During the last 3 days no fever was noted. Physical examination failed to reveal any abnormalities. Examination of the chest was negative. The liver, spleen, and nodes were not enlarged. An X-ray on April 24, 1945, showed miliary lesions in both lung fields with bilateral enlargement of hilar lymph nodes. A blood count showed 4,200,000 rbc per cu. mm. with 12 gm. Hgb, and 8350 wbc per cu. mm. with 58 percent polymorphonuclear leucocytes, 37 percent lymphocytes, and 5 percent eosinophils. The blood sedimentation rate was 25 and 29 mm. per hour (Cutler method). Urinalysis was negative. Routine agglutination tests were negative (typhoid fever, paratyphoid fever A and B, brucellosis). The patient was discharged after 10 days observation and study.

Second admission, November 1945 (to obtain 3 gastric washings for culture): The patient had exhibited a low-grade fever following discharge from the hospital in April 1945 and was kept on partial bed rest until September, at which time he returned to school. His temperature was normal. Physical examination disclosed palpable lymph nodes in the axilla, neck and inguinal area, of which only those in the inguinal area were believed to be enlarged. Examination of the chest was negative; the liver and spleen were not enlarged. The X-ray, urine and blood count were unchanged from the previous admission. The sedimentation rate was still elevated (21 mm. in 1 hr.). An agglutination test for brucellosis was negative. The patient was discharged after 3 days.

Skin test.—Histoplasmin was not available for skin testing until the second hospital admission. Still tuberculin negative, the patient was found on November 26, 1945 to have a positive reaction to histoplasmin of 9 mm. induration. Almost 2 years later, still histoplasmin-positive, the patient was skin-test negative to other fungus antigens.

Complement fixation tests.—Serum was first available for serologic testing 2½ years after the onset of symptoms. This serum gave a negative complement fixation test for both histoplasmosis and blastomycosis (August 18, 1947). Sera of September 15, 1947 and September 17, 1947 both showed complete (++++) fixation with histoplasmin and no fixation with blastomycin.

Mycology and bacteriology.—First admission: Three concentrated sputum smears were negative for tubercle bacilli. Four stool specimens were examined for ova and none were found.

Second admission: Three gastric specimens were obtained November 23, 1945, November 24, 1945, and November 25, 1945. A single colony of *Histoplasma capsulatum* was isolated on one plate from the first specimen. All other plates were negative. The three specimens were negative for tubercle bacilli by smear, culture and guinea pig inoculation. Eighteen subsequent gastrics over a period of the next 6 months were negative for tubercle bacilli and pathogenic fungi by culture.

Sternal marrow and peripheral blood obtained November 23, 1945 were negative for organisms by smear and culture.

Biopsy of an axillary lymph node was performed December 31, 1946; the gland was negative for tubercle bacilli and pathogenic fungi by microscopic study, culture, and animal (guinea pig, hamster) inoculation.

Course.—The patient has been out of the hospital 2 years. He feels well and attends school. The temperature and sedimentation rate are normal. The lung lesions appear to be calcifying. The histoplasmin skin test has remained positive on three subsequent retests.

Severe Clinical Illness, With Recovery

Case 2, W. B.[3] white, male, age 5 months. The infant lived on a farm in a small town 100 miles south of Kansas City, Mo. He was selected for study because of the clinical picture he presented (fever, hepatomegaly, splenomegaly, anemia, leucopenia).

History.—The patient had an illness of 3 weeks' duration consisting of vomiting, fever (104°) and a convulsion.

Admission findings—March 1, 1947: Positive physical findings included fever (105°), redness of both ear drums, hepatomegaly and splenomegaly.

A blood count showed 2,910,000 rbc per cu. mm. with 68 percent Hgb and 3,650 wbc per cu. mm. with 48 percent polymorphonuclear leucocytes and 51 percent lymphocytes. The sedimentation rate was 11 mm. per hr. Agglutinations for typhoid fever, paratyphoid fever (A and B), and brucellosis were negative. The total serum protein was 6.0 gm. per 100 cc., with albumin 4.08 and globulin 1.92. The chest X-ray was negative.

Skin tests.—On the second hospital day, histoplasmin and tuberculin tests were negative. On the 46th hospital day, the tuberculin test was still negative, but the histoplasmin test was positive (5 mm. of induration). On the 80th hospital day, the histoplasmin test was still positive, but tests with other fungus antigens were negative. Subsequent retests during the 3d, 4th, 6th and 8th months of hospitalization showed positive histoplasmin tests.

Complement fixation tests.—The complement fixation test for histoplasmosis was positive (++++) on July 1, 1947 (125th hospital day). Serum drawn July 10, 1947, August 15, 1947, October 3, 1947, and November 10, 1947, also gave a positive (++++) test, whereas serum of September 29, 1947, gave a 2+ complement fixation test.

When blastomycin was used as the antigen with the serum drawn on November 10, 1947, a 1+ complement fixation was noted. When this serum was diluted 1:2, no fixation was noted with blastomycin whereas complete (++++) fixation was still obtained with histoplasmin. The sera of September 29, 1947 and October 27, 1947 showed no fixation with blastomycin. The remaining sera were not tested with blastomycin.

Mycology and bacteriology.—Cultures of blood and sternal marrow, secured on March 21, 1947 (20th hospital day) were positive for *Histoplasma capsulatum.* Six other blood cultures had been taken during the first 46 hospital days; these had been sent to the hospital laboratory, kept there 10 days, recorded as negative and discarded. Blood cultures drawn on March 18, 1947, April 8, 1947, May 2, 1947, May 20, 1947, June 17, 1947, July 9, 1947, July 23, 1947, August 5, 1947, and August 19, 1947 were observed for a month and were negative.

Marrow smears were not examined for the presence of organisms.

Course.—The left ear drum ruptured on the 2d hospital day; the otitis then cleared. For 7 weeks the patient had a spiking temperature (up to 105°–106°), severe anemia (2,010,000 rbc per cu. mm.) and leucopenia (3,000 wbc per cu. mm.) Then slow improvement was noted.

The patient was discharged on December 20, 1947, after 9½ months hospitalization. At that time the liver and spleen were just palpable, and the temperature had been below 100° for 4 weeks. He had gained 3½ pounds in the last 3½ months. A blood count of November 25, 1947 showed 4,100,000 rbc per cu. mm. and 8,500 wbc per cu. mm.

---

[3] Studied in cooperation with Dr. J. C. McQueen, resident physician, Children's Mercy Hospital, Kansas City, Mo.

Severe Clinical Illness, Recovery Probable

Case 3, S. P.[4] white female, age 20 months. The patient was a resident of a Kansas town 200 miles southwest of Kansas City. She was selected for study because of the clinical picture she presented (fever, hepatomegaly, splenomegaly, anemia, and leucopenia).

History.—Protuberant abdomen and malaise for 4 months, following a period of fever diagnosed as influenza.

Admission findings.—March 23, 1947: Examination revealed a pale, emaciated infant with a temperature of 100°. The liver, spleen and peripheral lymph nodes were enlarged. A precordial systolic murmur was heard.

A chest X-ray revealed probable enlargement of the right hilar node with infiltration extending to the right base.

The red blood cell count was 3,060,000 per cu. mm. with 45 percent Hgb, while the white cell count was 6,400 per cu. mm., with 34 percent polymorphonuclear leucocytes and 68-percent lymphocytes. The platelet count was 160,000 per cu. mm.

Urinalysis showed only a trace of albumin. Total serum proteins were 5.12 with an albumin-globulin ratio of 3.29: 1.83. Sternal puncture study revealed a normal marrow; the marrow was not cultured.

Skin tests.—The tuberculin and histoplasmin skin tests were reported as negative on the 2d hospital day, but when repeated on the 85th hospital day (Aug. 25, 1947), the histoplasmin test was found to be positive (7 mm. of induration). On September 2, 1947, the patient was tested with other fungus antigens. A positive reaction was elicited only with blastomycin in a dilution of 1:1,000 (6 mm. induration). When the dilutions of histoplasmin and blastomycin were increased (1:2,000 and 1:5,000) blastomycin failed to elicit a reaction whereas histoplasmin was positive in both dilutions.

Complement fixation tests.—Serum of September 4, 1947, showed a 2+ anticomplementary effect. Sera obtained on September 11, 1947, October 13, 1947, and December 4, 1947 gave a positive (+ + + +) complement fixation test for histoplasmosis. Of these three latter sera, only that of October 13, 1947, showed any fixation (+ +) when blastomycin was used as antigen. When the serum was diluted 1:2, complete (+ + + +) fixation was still obtained with histoplasmin whereas no fixation (0) was obtained with blastomycin.

Mycology and Bacteriology.—Splenectomy was performed on the 90th hospital day; at operation an abdominal lymph node was removed and a biopsy of liver obtained. Culture of spleen yielded *Histoplasma capsulatum.* Multiple granulomata were noted in the excised spleen, node, and liver biopsy, though typical *Histoplasma* were not identified by microscopic study of the sections. A positive culture for *H. capsulatum* was obtained from the spleen of one of four mice inoculated with ground splenic tissue.

Three gastric aspirations were performed on September 2, 1947, September 3, 1947, and September 5, 1947; the specimens were inoculated into three mice and cultured. Two of the three mice were negative. The third is as yet unreported. From the specimen of September 2, 1947 (106th hospital day) *H. capsulatum* was isolated by culture. Cultures of spleen and gastric contents were negative for tubercle bacilli.

Two blood cultures of September 4, 1947 and October 13, 1947 were negative after 1 month.

---

[4] Reported through the courtesy of Dr. Herbert Miller, Department of Pediatrics, University of Kansas School of Medicine.

Course.—Between the 19th and 43d hospital days, the patient received 2,587 "r" (depth dose) of X-ray therapy over the spleen. Following this, the red blood cell count decreased and several transfusions were administered. The patient tolerated the transfusions poorly and developed fever of 104°–105° for several weeks. Due to the progressive thrombocytopenia (22,000 per cu. mm.) and leucopenia (2,150 wbc per cu. mm.), splenectomy was performed.

The patient's course has been favorable since her operation. Her temperature slowly fell to normal, her appetite improved and she was discharged from the hospital September 11, 1947, on the 114th hospital day. She has been followed at the clinic and has been observed to be stationary in weight and free of fever for 2 months. It is now 5 months since the operation and 12 months since the onset of symptoms.

Severe Clinical Illness, Recovery Questionable

Case 4, G. M.[5] white male, a farmer, age 52 years. The patient has been a resident of Topeka, Kans., for many years. He was referred for study because of unexplained pulmonary lesions, a negative tuberculin but a positive histoplasmin skin test, and a positive (++++) complement fixation test for histoplasmosis.

History.—The patient's illness was of 3½ months duration, and consisted of cough, recurrent bouts of fever, anorexia, weakness, and loss of weight.

Admission findings.—October 26, 1947: The temperature was 99° and the blood pressure 130/80. Several lesions resembling basal cell epitheliomas were noted on the face; these had been present for 20 years. There was a rough systolic murmur in the left third interspace; the second pulmonic sound was accentuated. The left side of the chest showed diminished excursion, dullness and increased voice transmission. Rales were heard over both lower chest areas. The liver was slightly enlarged; the spleen was not felt. The peripheral lymph nodes were not enlarged.

A chest X-ray showed infiltration throughout the entire left lung and in the right upper lobe, with the heart displaced to the left. The apical pleura was thickened. Bronchograms revealed moderate cylindrical bronchiectasis on both sides.

A blood count showed 4,010,000 rbc per cu. mm., with 11.0 gm. Hgb, and 10,950 wbc per cu. mm. with 63 percent polymorphonuclear leucocytes, 28 percent lymphocytes, 6 percent esosinophils and 3 percent monocytes.

The blood sugar was 109 mg. percent, creatinine 1.5 mg. percent, and the N. P. N. 30. Total serum proteins were 6.83 gm. per 100 cc. (albumin 4.02 and globulin 2.81).

Skin tests.—On the 2d hospital day, the tuberculin skin test was negative and the histoplasmin skin test was positive (11 mm. of induration). On the same day, a skin test with blastomycin was negative. In addition to these tests, the patient had a record of a previous positive histoplasmin and negative tuberculin test.

Complement fixation tests.—Sera obtained October 8, 1947, October 23, 1947, and October 28, 1947 gave positive (++++) complement fixation tests for both histoplasmosis and blastomycosis. Similar results were found when the serum was diluted 1:2. When the serum was diluted 1:4, complete (++++) fixation was still noted with histoplasmin whereas only 1+ fixation was obtained with blastomycin.

Mycology and bacteriology.—*H. capsulatum* was cultured from each of two sputum specimens obtained October 27, 1947 and October 28, 1947. That of

---

[5] Referred by Dr. M. E. Roe, Hillcrest Sanatorium, Topeka, Kans.

October 29, 1947 was negative by culture. A gastric of October 27, 1947 was negative by culture. None of the sputa or gastrics was inoculated into animals. A biopsy of one of the skin lesions on the face was negative by culture for pathogenic fungi. Cultures obtained by bronchoscopy were negative for pathogenic fungi.

Course.—The patient was discharged from the hospital after 7 days' study. He was seen 6 weeks after discharge, on January 5, 1948. He was feeling well and had gained 17 pounds in the past 3 months. His temperature was normal. He raises 1 ounce of sputum in the morning. A chest X-ray showed an apparent spread of the infiltrative process to the right mid-lung field. A blood count showed 10,250 wbc per cu. mm. with 68 percent polymorphonuclear leucocytes, 22 percent lymphocytes, 8 percent monocytes and 2 percent eosinophils.

Serious Clinical Illness, Recovery Questionable

Case 5, R. J., a 64-year-old male clerk who had lived all his life within 25 miles of Kansas City, Mo. He was studied because his serum showed a positive (++++) complement fixation test for histoplasmosis.

History.—Since June 1947 the patient has had a chronic cough with a small amount of sputum but no hemoptysis. In October 1947 he developed a severe diarrhea without blood. This persisted until the time of admission on December 5, 1947. He had lost about 25 pounds in weight in the 5 months preceding admission.

Admission findings.—Positive physical findings were limited to clubbing of the fingers, palpable axillary nodes and signs of cavitation in the upper lobe of the right lung. Spleen and liver were not palpable. The white blood count was 17,900 per cu. mm. with 79 percent polymorphonuclears, 9 percent lymphocytes, 6 percent monoctyes and 6 percent eosinophils. The hemoglobin was 11.5 grams per 100 cc. Sedimentation rate was 27 mm. in 1 hour (Cutler method). Urine was negative.

Skin tests.—Tuberculin skin tests were positive on the 12th and 31st hospital days. Histoplasmin skin tests were positive on the 2d, 12th, and 31st hospital days. Blastomycin skin tests were negative on the 31st hospital day.

Complement fixation tests.—A positive (++++) complement fixation test for histoplasmosis was found for the patient's sera drawn on the 2d, 14th, and 31st hospital days. A positive (++++) blastomycosis complement fixation test was found on the first and third sera while the second serum was negative. Serum dilutions employing histoplasmin and blastomycin as antigens have not as yet been completed.

Mycology and bacteriology.—Four sputa and three gastic lavages have been cultured for fungi and tubercle bacilli and injected into mice and guinea pigs. The complete reports are not yet available but the gastric lavage of December 22, 1947 has yielded large numbers of typical colonies of *H. capsulatum.* No tubercle bacilli have grown as yet on culture (6 weeks). Nine sputa have shown negative smears for acid-fast organisms by the concentration method.

Course.—It is yet too early to estimate the eventual outcome of this case. The patient runs a slight elevation of temperature (up to 99.8°) and his sedimentation rate remains above normal (26, 31). He continues under hospital observation.

Severe Clinical Illness; Death Following Surgery

Case 6, J. G., white male, a student, age 26. He had been a resident of Kansas City, Mo., for 2½ years, having previously been in the Army, serving in Germany 2½ years. He was born, 100 miles southeast of Kansas City, Mo., and lived there for 20 years. He was selected for study because of a positive complement fixation test for histoplasmosis.

History.—The patient had had an episode of hemoptysis 2 years before the present illness. Now, he complained of a similar episode which had followed 2 weeks of chest pain and aggravation of a chronic cough. He had lost 20 pounds in weight over a 6-month period.

Admission findings.—First admission, June 13, 1947: The patient was a well-nourished young man coughing up large amounts of blood. He had a normal temperature. Examination revealed diminished breath sounds and coarse rales over the right lung. The liver, spleen, and peripheral lymph nodes were not enlarged. A chest X-ray showed only accentuation of the markings extending downward from both hilar areas, particularly on the right. The red cell count was 3,010,000 per cu. mm., with 8.3 gm. Hgb. The white cell count was 8,950 per cu. mm. with 64 percent polymorphonuclear leucocytes, 30 percent lymphocytes, and 6 percent monocytes.

Conservative therapeutic measures failed to check the bleeding and on July 4, 1947 (21st hospital day) a right lower lobectomy was performed. The bleeding ceased, but a bronchopleural fistula developed. The patient was discharged on July 28, 1947, to return in 1 month for surgical repair of the bronchopleural fistula.

Second admission, August 28, 1947: For the preceding month, the patient was in as good health as a bronchopleural fistula would permit. Physical examination revealed only a well-healed wound in the right chest, and the signs of a right pneumothorax. A chest X-ray showed complete pneumothorax on the right; an increase in the mottling and striation on the left was also noted. A blood count showed 3,900,000 rbc per cu. mm., with 11.5 gm. Hgb, and 8,600 wbc per cu. mm. An operation was performed.

Skin test.—On July 5, 1947, the patient had a positive tuberculin (17 mm. induration) and histoplasmin skin test (17 mm. induration). The same results were obtained on July 22, 1947 and August 12, 1947. The blastomycin skin test was negative (August 12, 1947).

Complement fixation tests.—Serum of July 5, 1947 showed a 1+ complement fixation for histoplasmosis; that of July 9, 1947, a positive (++++) result; that of July 22, 1947, ++, that of August 12, 1947, ++, and that of September 3, 1947, 1+. The serum of July 9, 1947 which had shown ++++ fixation with histoplasmin, also showed ++++ fixation with blastomycin. Sufficient serum of this date was not available to employ serial serum dilutions to demonstrate differences between antibody titers against these two antigens.

Mycology and bacteriology.—One blood culture (September 3, 1947) and three sputum cultures (July 8, 1947, August 14, 1947, August 15, 1947) were negative for pathogenic fungi and tubercle bacilli by culture, but positive for tubercle bacilli by animal inoculation.

Cultures of pooled organs obtained at autopsy were negative for *H. capsulatum* but positive for tubercle bacilli. Mice were inoculated with ground, pooled autopsy tissue: one died 22 days later. Culture of the brain and spleen of this mouse yielded growth of *H. capsulatum.*

Course.—The patient's hemoptysis was stopped by resection of the right lower lobe. The procedure was technically difficult and had to be completed by the placing of mass hilar ligatures. Following the first operation, a bronchopleural fistula developed.

At the second operation, decortication of most of the visceral pleura was performed, as well as closure of the right lower lobe bronchus. At the conclusion of the surgery, the patient was in surgical shock. He expired less than 24 hours after surgery, without regaining consciousness.

Autopsy revealed complete atelectasis of the remaining two lobes of the right lung, small firm nodules in the left upper lung and interstitial hemorrhage in the cortex of the right kidney.

Microscopically, the lung contained numerous tubercle-like lesions, with epitheliod cells, giant cells, and central necrosis. *Histoplasma* have not been definitely identified in these lesions.

Progressive Fatal Disease

Case 7: F. T.[6] a 48-year-old white male pattern maker, lived only 6 months in Kansas City. He had moved here from Detroit, Mich., which had been his home for at least 25 years.

He was studied because of X-ray findings suggestive of tuberculosis, accompanied by a negative tuberculin skin test.

History.—The patient's chief complaints were fever, weight loss and weakness beginning about 2½ years before the present admission. At that time he was studied in a Detroit hospital where the chief findings were anemia, splenomegaly, and bilateral lung infiltrations. Tuberculosis was suspected but never proved even after laboratory study. His tuberculin test was negative. A diagnosis of pernicious anemia was made and liver therapy was instituted. He improved but was never able to do more than restricted work. Four weeks before his final admission, he developed chills and fever and progressive weakness.

Admission findings.—May 20, 1947: Moist rales were heard in the left midlung and the breath sounds were increased at the left apex. No cough or sputum was noted. The spleen was palpable; the liver was not palpable. No peripheral lymph nodes were palpated. The temperature was 103° and the blood pressure 105/65. The red blood count was 3,500,000 per cu. mm. with 10.5 gm Hgb. The white cell count was 1,000 per cu. mm. with 20 percent polymorphonuclear leucocytes, 56 percent lymphocytes, 4 percent eosinophils and 20 percent monocytes. Blood sedimentation rate was 27 mm. in 60 minutes (Cutler method). Urinalysis was negative. X-rays of the chest showed bilateral "stringy" infiltrations in both apical areas.

Skin tests.—Histoplasmin and tuberculin skin tests were negative on the 8th hospital day. When repeated 5 weeks later the histoplasmin test was positive (15 mm. of induration) while the tuberculin was again negative. Histoplasmin tests were again positive, during the 7th, 8th, and 10th weeks of hospitalization. Skin tests with other fungus antigens during the 7th week were negative.

Complement fixation tests.—The serum of this patient obtained on July 1, 2, and 16 showed a positive (++++) complement fixation test for histoplasmosis. Serum of July 8 showed only 1+ fixation. The serum of July 2 also showed a positive (++++) blastomycosis complement fixation test. When this serum was diluted 1:2 there was still ++++ fixation with histoplasmin but only ++ fixation with blastomycin. When diluted 1:4 the serum showed 1+ fixation with histoplasmin and none with blastomycin. Blastomycosis complement fixation tests were not performed on the other sera from this patient.

Mycology and bacteriology.—Gastric washings were obtained on May 27, 28, and 29. Smear, culture and animal inoculation of these specimens were negative for tubercle bacilli. Culture of these gastric washings for fungi revealed profuse typical growth of *H. capsulatum* on the specimen of May 29. Splenectomy was performed on July 2, 1947. The spleen showed miliary nodules grossly. Direct smear of plenic pulp and microscopic study of the spleen revealed typical intracellular *Histoplasma*. This fungus was also recovered on culture of the spleen. No attempt was made to isolate tubercle bacilli from this organ.

---

[6] Reported through the courtesy of Dr. Graham Asher, of Kansas City, Mo.

The patient died on September 8, 1947. Post mortem cultures of the mesenteric, thoracic, hilar and axillary nodes, adrenal, testes, sternal marrow, liver, lung, prostate, kidney and pectoral muscle were positive for *H. capsulatum*. Cultures of the cardiac muscle were negative for pathogenic fungi. Attempts to isolate tubercle bacilli were made from only the lung and adrenal. The lung was positive for tubercle bacilli by smear, culture and guinea pig inoculation. The adrenal was positive for tubercle bacilli only by guinea pig inoculation, smear being negative and cultures contaminated.

Pathological examination revealed a large number of typical intracellular *Histoplasma* in the lungs, liver, adrenal, heart muscle, kidney, sternal marrow, and intestine. In addition, a number of acid-fast bacilli were seen in focal suppurative lesions in the lung and adrenal;[7] no tubercles typical of tuberculosis were identified.

Course.—The patient's condition constantly deteriorated. His spleen became larger and his liver became palpable. He continued to run a fever up to 104° daily. His anemia became more severe (down to 1,000,000 red blood cells per cu. mm.). His platelets fell as low as 72,000 per cu. mm. and his reticulocytes at one time were as high as 58 percent. The infiltrations in his lungs increased and spread to the lung bases. Because of his anemia and steadily deteriorating condition, splenectomy was performed on July 2, 1947. The spleen was enlarged at operation and was studded with small nodules. The patient was given many transfusions which were poorly tolerated and usually accompanied by reactions. The downhill course continued and the patient expired on September 8, 1947.

Autopsy findings.—There was marked infiltration of the upper lobe of the left lung with necrosis, calcified hilar lymph nodes, enlarged thoracic and abdominal lymph nodes, miliary lesions of the liver, mucosal ulceration of the small bowel and gall bladder, and fluid accumulations in the body cavities.

Progressive Fatal Disease

Case 8, E. W.,[8] white female, a housewife, age 53. The patient had been a resident of Kansas City, Mo., for 24 years. She was selected for study because of the clinical picture she presented (fever, pulmonary infiltration, hepatomegaly, anemia, and leucopenia).

History.—The present illness began in March, 4 months before admission, with a respiratory illness, diagnosed as influenza. Following this, the patient noted daily fever up to 101–103°, increasing lethargy, a 10-pound weight loss headaches, and occasional emesis.

Admission findings.—July 14, 1947: The temperature was 103° and the blood pressure 100/75. Positive physical findings included bronzing of the skin, diminished breath sounds over the left upper chest area, enlargement of the liver down to the umbilicus, and erosions of the cervix uteri with a purulent cervical discharge. The spleen and peripheral lymph nodes were not enlarged. A blood count showed 3,690,000 rbc per cu. mm. with 8.3 gm. Hgb, and 4,000 wbc cu. mm. with 67 percent polymorphonuclear leucocytes, 22 percent lymphocytes and 11 percent monocytes. A chest X-ray showed strand-like infiltration in both infraclavicular areas. Agglutination tests for typhoid fever, paratyphoid fever, brucellosis, typhus, and tularemia were negative.

---

[7] To be reported in detail by Dr. T. R. Hamilton, of the Department of Pathology, University of Kansas School of Medicine.

[8] To be reported in detail by Dr. Victor Buehler and Dr. Clare Fitzwilliam, General Hospital, Kansas City, Mo.

Skin tests.—Tuberculin and histoplasmin skin tests were negative on August 8, 1947 (24th hospital day), August 20, 1947, September 8, 1947, and September 22, 1947. In addition, skin tests with blastomycin and coccidioidin were negative (August 8, 1947).

Complement fixation tests.—Serum obtained on the 26th hospital day gave a negative complement fixation test for histoplasmosis and blastomycosis.

Mycology and bacteriology.—Cultures of blood (August 8, 1947) bone marrow (August 11, 1947, August 20, 1947) axillary and inguinal lymph nodes (August 20, 1947) and bronchoscopic aspirations (August 12, 1947) were negative for pathogenic fungi.

Cultures of pooled organs (liver, lung, lymph node, spleen) obtained at autopsy were positive for *H. capsulatum* and negative for tubercle bacilli.

Course.—During hospitalization the patient showed a daily, spiking fever, up to 105°. The anemia and leucopenia became more severe (September 15, 1947: 1,960,000 rbc per cu. mm. and 2800 wbc per cu. mm.). Lymph node biopsy was performed August 20, 1947. A histologic diagnosis of Hodgkin's disease was made on sections of the excised lymph nodes. On the basis of this diagnosis, X-ray therapy was given. Between the 43d and 67th hospital days, the patient received 3400 "r" units of deep X-ray therapy, applied over the chest, abdomen, and groin. The patient's course continued to be characterized by high daily fever and she expired October 12, 1947.

Autopsy revealed fluid accumulations in the pleural and peritoneal cavities, greyish infiltrates in both upper lung fields, tiny lesions scattered throughout the liver, and generalized enlargement of lymph nodes. Microscopic study of organ sections showed changes consistent with Hodgkin's disease in the liver, spleen, adrenals, and lymph nodes. Within the lesions in the adrenal and liver were seen large numbers of parasites having the morphologic characteristics of *H. capsulatum.*

Progressive Fatal Disease

Case 9, P. P., white female, age 6 months. The patient lived on a farm 100 miles east of Kansas City, Mo. She was selected for study because of the clinical picture she presented (fever, hepatomegaly, splenomegaly, anemia, leucopenia, and thrombocytopenia).

History.—For 4 weeks the infant cried whenever her legs were moved. Her formula was made of evaporated milk and boiled well water. No supplementary vitamin C was provided.

Admission findings.—October 21, 1947: The infant was seriously ill, with a temperature of 101°. The legs were held in a frog-like position and were apparently tender on movement or pressure. The ribs were beaded. The liver and spleen were enlarged; the peripheral nodes were not palpable. A chest X-ray showed enlargement of the right hilar node with infiltration in the right lower lung field, medially. A blood count revealed 2,120,000 rbc per cu. mm. with 4.9 gm. Hgb and 2,800 wbc per cu. mm. with 38 percent polymorphonuclear leucocytes, 58 percent lymphocytes, and 4 percent monocytes.

Skin tests.—On the 9th hospital day, tuberculin, histoplasmin, and blastomycin skin tests were negative.

Complement fixation tests.—Blood drawn on the 9th hospital day showed a 1+ complement fixation test for histoplasmosis. Blood drawn from the heart at autopsy (6 days later) gave +++ complement fixation for histoplasmosis. Neither blood specimen showed any complement fixation when blastomycin was used as the antigen.

Mycology and bacteriology.—Organisms, whose morphology was typical of *H. capsulatum,* were seen in bone marrow smears made on the 10th hospital day.

Peripheral blood cultures (October 30, 1947, October 31, 1947) and a marrow culture (October 31, 1947) were positive for *H. capsulatum.*

Smears of splenic pulp, bone marrow, and peripheral blood obtained at autopsy showed the presence of many parasites typical of *H. capsulatum.* A culture of blood obtained at autopsy was positive for *Histoplasma.* Positive cultures were obtained from pooled liver and spleen, and lung and node, as well as from one of four mice inoculated with pooled tissue.

Microscopic study of sections of liver, lung, spleen, lymph node, adrenal, bone marrow, and meninges showed the presence of myriads of *Histoplasma.*

Course.—The infant's course was characterized by continued fever (up to 103°), increasing anemia (1,950,000 rbc per cu. mm.), abdominal distension and purpura. The patient died on the 14th hospital day. Treatment consisted of transfusions, penicillin, and streptomycin.

Autopsy revealed pallor, edema, and polyserositis. The liver was enlarged, firm and almost devoid of its normal architecture. The spleen was enlarged, as were the abdominal and thoracic lymph nodes. There was hyperplasia of the lymphoid tissue in the wall of the intestine with ulceration of the mucosa over these areas. Lesions were noted in the adrenals and kidneys. There was a dense infiltrative process in the right lower lobe of the lung, with enlargement of the hilar node.

Progressive Fatal Disease

Case 10, J. W.[9] white male, laborer, age 37. The patient was a lifetime resident of a Kansas town 20 miles northwest of Kansas City. He was referred for study because of miliary lung lesions and a negative tuberculin test.

History.—The patient first became ill, 8 months before admission, with a respiratory illness diagnosed as influenza. He never fully recovered, and for the 6 months before admission complained of abdominal pain, radiating to the back. The pain occurred several times daily and was severe enough to wake the patient at night. Over this 8-month period, the patient had lost 40 pounds in weight. Three X-ray examinations of the gastro-intestinal tract were reported as negative.

Admission findings.—October 21, 1947: The temperature was 103°. Examination disclosed emaciation, tachycardia, and a palpable spleen. The liver and peripheral lymph nodes were not enlarged. Examination of the chest was negative. A chest X-ray showed a diffuse pulmonary infiltration of unusual character, best described as a fine reticulation. A blood count showed 3,000,000 rbc per cu. mm. with 55 percent Hgb, and 6,500 wbc per cu. mm. with 83 percent polymorphonuclear leucocytes, 8 percent lumphocytes, 3 percent eosinophils, 1 percent basophils, and 5 percent transitional cells.

A blood sugar was 78 mg. percent; the NPN was 29.

Skin tests.—One week before death, tuberculin and histoplasmin skin tests were negative.

Complement fixation tests.—Serum obtained 1 week before death showed a positive (++++) complement fixation test for histoplasmosis and blastomycosis. At a 1:2 serum dilution, complete (++++) fixation was noted with histoplasmin but no (0) fixation was noted with blastomycin. The same findings were noted at a 1:4 serum dilution.

Mycology and Bacteriology.—No cultures were available on this patient. Tissues obtained at autopsy were studied microscopically; the lung, liver, spleen, and lymph nodes were seen to be crowded with parasites whose morphology was characteristic of *H. capsulatum.*

Course.—The patient's 17-day hospital course was terminated abruptly by a massive rectal hemorrhage. Autopsy showed "granularity" of the lungs, enlargement of the spleen and of the mesenteric lymph nodes and hyperemia of the mucosa of the rectum and sigmoid colon. No definite lesions were noted in these organs, though they cut with increased resistance.

---

[9] **Reported through the kindness of Dr. Gorden Vorhees, Leavenworth, Kans.**

DISCUSSION

Ten cases of histoplasmosis have been presented, nine confirmed by the isolation of *Histoplasma capsulatum* from cultures, and one confirmed by the typical microscopic appearance of intracellular parasites. In each of these cases, the diagnosis was substantiated by more than one laboratory test. Table 1 presents a summary of the various diagnostic tests which were performed and their results. It also shows that more than one positive finding occurred with each case. Furthermore, no single method gave positive results each time it was used. While the complement fixation and skin tests individually or jointly may not be considered diagnostic, their agreement in 8 of the 10 cases is worthy of note.

TABLE 1.—*Results of laboratory tests performed*[1] *in 10 proved cases of histoplasmosis*

Case No.	Skin test	Complement fixation test	Gastric	Sputum	Blood		Marrow		Culture of patient's tissue	Pathology		Culture[2] of animal's spleen	X-ray
					Culture	Smear	Culture	Smear		Human tissue	Tissue of inoculated animals		
1	+	++++	+	------	−	-------	−	-------	--------	−	------	--------	+
2	+	++++	------	------	+	-------	+	-------	--------	------	------	--------	−
3	+	++++	+	------	−	-------	------	-------	+	[3] +	------	+	------
4	+	++++	−	+	------	-------	------	-------	−	------	------	--------	+
5	+	++++	+	------	------	-------	------	-------	--------	------	------	--------	+
6	+	++++	------	−	−	-------	------	-------	--------	[3] +	------	+	+
7	+	++++	+	------	−	-------	+	-------	+	+	+	+	+
8	−	−	------	------	−	-------	−	-------	+	+	------	--------	+
9	−	[4] +++	------	------	+	+	+	+	+	+	------	+	+
10	−	++++	------	------	------	-------	------	-------	--------	+	------	--------	+

[1] If no entry is made, test was not performed.
[2] Splenic culture of animals inoculated with human biopsy or autopsy tissue.
[3] Granulomata present in tissues. No *Histoplasma* definitely identified.
[4] Test result on blood obtained from heart at autopsy.

A summary of the cases by age, sex, duration of illness, and outcome is presented in table 2. Skin test, serological and X-ray data on each case are also shown.

TABLE 2.—*Summary of 10 proved cases of histoplasmosis*

Case	Age	Sex	Skin test	Complement fixation test	X-ray	Length of illness	Outcome
1-CD	13 years	M	Positive	++++	Positive	2½ years	Recovered.
2-WB	7 months	M	Positive	++++	Negative	5 months	Recovered.
3-SP	20 months	F	Positive	++++	Questionable	6 months	Improving.
4-GM	53 years	M	Positive	++++	Positive	8 months	Unimproved.
5-RJ	64 years	M	Positive	++++	Positive	6 months	Unimproved.
6-JG	26 years	M	Positive	++++	Positive	1 month	Death.
7-FT	48 years	M	Positive	++++	Positive	2½ years	Death.
8-EW	54 years	F	Negative	0	Positive	4 months	Death.
9-PP	6 months	F	Negative	[1]+++	Positive	6 weeks	Death.
10-JW	37 years	M	Negative	++++	Positive	1½ years	Death.

[1] Test result on blood obtained from heart at autopsy.

As indicated in the above table, positive skin reactions were elicited with histoplasmin (H–15) in seven of the ten cases of histoplasmosis. Two of the three nonreactors were skin-tested within 1 week of death (cases 9 and 10), while the third nonreactor (case 8) had a temperature of 105° at the time of both tests. It is known that tuberculous patients who are near death or have a high temperature show a decreased sensitivity to tuberculin (*10*). Evidence available from other studies, to be reported later, shows that critical illness and fever similarly depress sensitivity to histoplasmin. The depression of skin sensitivity due to these factors could explain the negative histoplasmin tests both among our cases of histoplasmosis and among those reported in the literature. Histoplasmin skin test results have been previously reported in only nine proved cases of histoplasmosis (*1*, *11*, *12*, *13*, *14*, *15*, *16*). Four of the nine had positive skin tests. Of the five negative reactors, four were tested 1 month before death and one was tested 5 months before death.

Changes in skin sensitivity from negative to positive were observed in three patients. At the time of the first test, two had high fevers and presented a clinical appearance of severe illness. The third was first tested 3 weeks after the onset of illness. Although sensitization of the patients to histoplasmin is a possibility, it does not seem likely in the light of our experience in retesting thousands of nonreactors during the last 2 years. No evidence of such sensitization has been observed.

Regardless of the explanation of the initial negative test results, repeated skin tests appear to be of value since in these proved cases of histoplasmosis significant fluctuations in sensitivity occurred during the illness.

In addition to histoplasmin, the antigens specified in the section on Materials and Methods were used in some instances. Blastomycin was the only other fungus antigen with which a reaction was obtained and that only in case 3, who reacted about equally to 1:1000 histoplasmin and blastomycin. When these two antigens were diluted further (1:2000 and 1:5000), no reactions were obtained with blastomycin whereas histoplasmin produced reactions in both dilutions.

The complement fixation test for histoplasmosis was performed with the serum of each patient. Table 2 shows that antibodies were demonstrated in 9 of 10 sera. Eight sera showed complete fixation of complement (cases 1, 2, 3, 4, 5, 6, 7, 10). One serum showed partial fixation (case 9) and 1 serum was negative (case 8). Case 9 showed only 1+ fixation 1 week before death, but blood drawn from the heart at autopsy showed ++++ fixation. Altogether, 90 percent of the cases had antibodies for histoplasmin in their sera. This is in sharp contrast to 5.4 percent obtained on 242 controls (*6*).

Complement fixation tests using blastomycin as the antigen were also performed with the undiluted serum of each patient. Three of the sera showed no fixation with blastomycin (cases 1, 8, 9). Two of the sera (cases 2, 3) showed more antibodies against histoplasmin (2 or more degrees difference of fixation), while 5 sera (cases 4, 5, 6, 7, 10) showed complete ++++ fixation with histoplasmin and blastomycin. In three of these last five (cases 4, 7, 10), complement fixation tests were set up in parallel with both histoplasmin and blastomycin as antigens, using serial dilutions of each serum (table 3).

As shown in table 3, this technic demonstrated that, in cases 4, 7, and 10, antibodies against histoplasmin were present in higher titer than those against blastomycin. Studies are not complete on case 5; sufficient serum was not available for titration on case 6. Thus, under the conditions of the test, more antibodies were demonstrated for histoplasmin than for blastomycin in all the proved cases of histoplasmosis on whom studies were completed.

TABLE 3.—*Complement fixation tests with dilutions of sera which, undiluted gave equal (++++) fixation with histoplasmin and blastomycin*

Case No.	Serum dilution	Complement fixation with—	
		Histoplasmin	Blastomycin
4	1:2	++++	++++
	1:4	++++	+
	1:8	+	0
7	1:2	++++	++
	1:4	+	0
10	1:2	++++	0
	1:4	++++	0

This device of diluting the antigens in skin tests and the serum in complement fixation tests in order to distinguish a specific from a cross-reaction demands careful study before its value can be determined conclusively.

The chest X-ray findings are also of interest (table 2). In two cases (6, 9) the chief finding was infiltration in and about the right hilum, extending toward the right base. In addition, case 3 showed probable infiltration in the area of the right hilum. In four cases (4, 5, 7, 8) the chief finding was a "strand-like" infiltration in both apical and sub-apical areas. Cavitation was noted only in case 5. In two cases (1 and 10) the infiltration was miliary in type. The infiltrates were larger and more discrete in case 1 than in case 10.

The isolation of *H. capsulatum* from the gastric contents of histoplasmosis patients has not previously been reported. Therefore, it seems worthwhile to emphasize that the organism was isolated in this manner from four patients (cases 1, 3, 5, 7).

In two cases, coexistent tuberculosis and histoplasmosis were demonstrated. Tubercle bacilli were demonstrated by culture and animal inoculation in cases 6 and 7. Laboratory studies of case 5 are not complete. He is suspected of having coexistent tuberculosis because of positive tuberculin test and cavities in his lung as shown in chest X-ray. Similar coexistence of tuberculosis and histoplasmosis was found in four of the fatal cases reported in the literature (*1*). Case 7 represents a case of histoplasmosis which fulfilled all the clinical and pathological criteria of Hodgkin's disease and was so considered until cultural and microscopic studies were completed.

All of the cases reported lived within a radius of 200 miles of Kansas City. Five came from greater Kansas City, three lived in the State of Kansas outside Kansas City, and two in the State of Missouri, outside Kansas City, Mo.

In view of the existing belief that histoplasmosis is almost always fatal, it may be appropriate to reiterate the statement that 5 of the 10 patients are alive. Cases 1 and 2 are clinically well. Case 3 is improved and will probably recover, but in cases 4 and 5, recovery is questionable. The primary cause of death of case 6 was not histoplasmosis but postoperative surgical shock.

It has been postulated on the basis of histoplasmin skin testing and roentgenographic findings that there exists a benign form of histoplasmosis (*2*, *3*) whose final stage is represented by pulmonary calcification. In view of the current interest in this concept, it seems worthwhile to emphasize certain facts regarding case 1. The patient fulfills the chief criterion for diagnosing histoplasmosis as he has a positive gastric culture. In addition, his serum shows complement fixation and his histoplasmin skin test is positive. His chest X-ray shows miliary lesions which are healing by calcification. He has been followed for almost 3 years and definite deposition of calcium in his lesions has been observed. During this period he has been well enough to attend school.

Of the five fatal cases, two were confirmed by culture before death and two were suspected on the basis of positive complement fixation tests.

SUMMARY

1. Ten cases of histoplasmosis in residents of the Kansas City area are described. Nine of these were proved by cultural isolation of the etiologic agent, and one by the typical pathological picture.

2. Two of the five surviving patients have apparently recovered completely. A third will probably recover and the prognosis for the fourth and fifth is doubtful.

3. Nine of the cases were diagnosed within a period of 9 months.
4. Of the 10 patients, 7 developed sensitivity to histoplasmin and complement fixing antibodies were demonstrated in the sera of these same patients. Only one patient failed to show either skin hypersensitivity or complement fixing antibodies.
5. Sensitivity to both blastomycin and histoplasmin was observed in the skin tests of one patient. Serial antigen dilutions showed that the heterologous reaction was weaker than the homologous.
6. Complement fixing antibodies for blastomycin as well as for histoplasmin were demonstrated in the sera of seven patients. In all titrated sera the antibodies against histoplasmin were present in greater amounts.
7. Pulmonary infiltration was noted by X-ray in eight cases; probable infiltration was noted in another case. Two of these eight cases presented the roentgenographic picture of miliary lung lesions.
8. *Histoplasma capsulatum* was isolated by culture from the gastric content of four patients with histoplasmosis.

ACKNOWLEDGMENT

The authors wish to acknowledge the contribution of Dr. Arden Howell, Jr. His skill and experience in medical mycology have been of inestimable value in completing the work reported here. Dr. Howell adapted the procedures employed in our laboratory for isolating *H. capsulatum* and made the final identification of the organisms recovered.

REFERENCES

(*1*) Parsons, R. J., and Zarafonetis, C. J. D.: Histoplasmosis in man. Arch. Int. Med. **75**: 1–23 (1945).

(*2*) Palmer, C. E.: Nontuberculous pulmonary calcification and sensitivity to histoplasmin. Pub. Health Rep. **60**: 513–520 (1945).

(*3*) Christie, Amos and Peterson, J. C.: Pulmonary calcification in negative reactors to tuberculin. Am. J. Pub. Health. **35**: 1131–1147 (1945).

(*4*) Peterson, J. C.: Symposium on systemic mycoses, given before Am. Academy of Pediatrics, Dallas, Texas (December 8–9, 1947).

(*5*) Furcolow, M. L., Mantz, H. L., and Lewis, I.: The roentgenographic appearance of persistent pulmonary infiltrates associated with histoplasmin sensitivity. Pub. Health Rep. **62**: 1711–1718 (1947).

(*6*) Furcolow, M. L., Bunnell, I. L., and Tenenberg, D. J.: A complement fixation test for histoplasmosis. II. Preliminary results with human sera Pub. Health Rep. **63**: 169 (Feb. 1948).

(*7*) Howell, Arden, Jr.: Studies of fungus antigens. I. Quantitative studies of cross-reactions between histoplasmin and blastomycin in guinea pigs. Pub. Health Rep. **62**: 631–651 (1947).

(*8*) Tenenberg, D. J., and Howell, Arden, Jr.: A complement fixation test for histoplasmosis. I. Technic and preliminary results on animal sera. Pub. Health Rep. **63**: 163 (Feb. 1948).

(*9*) Thompson, Luther: Note on a selective medium for fungi. Proc. of the Staff Meetings of the Mayo Clinic. **20**: 248–249 (1945).

(*10*) Furcolow, M. L., Howell, Barbara, and Nelson, Waldo E.: Quantitative studies of the tuberculin reaction. III. Tuberculin sensitivity in relation to active tuberculosis. Am. Rev. Tuber. XLV: (5) 504 (1942).

(*11*) Van Pernis, P. A., Benson, M. E., and Holinger, P. H.: Specific cutaneous reactions with histoplasmosis. J. A. M. A. **117**: 436–437 (1941).

(*12*) McLeod, J. H., Emmons, C. W., Ross, S., and Burke, F. G.: Histoplasmosis. J. Pediat. **28**: 275–295 (1946).

(*13*) Iams, A. M., Keith, H. M., and Weed, L. A.: Histoplasmosis in infancy: Report of a case in an infant with a brief clincopathological review. Proc. Staff Meet. Mayo Clin. **21** (25): 490–495 (1946).

(*14*) Davis, H. V. and Neff, F. C.: Histoplasmosis in infancy. Am. J. Dis. Child. **71**: 171–177 (1946).

(*15*) Curtis, A. C., Cawley, E. P.: Genital histoplasmosis. J. Urol. **57**: 781–787 (1947).

(*16*) .Miller, H. E., Keddie, S. M., Johnstone, H. G., and Bostick, W. L.: Histoplasmosis. Cutaneous and mucomembranous lesions, Mycologic and Pathologic observations. Arch. Derm. and Syph. **56**: 715–739 (December 1947).

NEW OFFICIAL CLASSIFICATIONS FOR TUBERCULOSIS IN GREAT BRITAIN

The following revised classifications for tuberculosis were adopted by the Ministry of Health of Great Britain in May 1947. It is reprinted here for the consideration of American phthisiologists.

Revision of Section I of the Appendix to Memorandum 37/T (Revised).

SECTION I

A. Classification of Patients Suffering From Tuberculosis

For the purpose of the Annual Returns required under this memorandum, and of the case records necessary to enable these returns to be completed, the following system of classification of cases and of recording results should be used:

I.—All patients should be grouped according to their sex and age; patients under 15 years of age should be classed as children, and those of 15 years and upwards as adults.

II.—Patients should be divided into respiratory and nonrespiratory tuberculosis cases as follows:

(1) A respiratory case should be one in which there is a tuberculous lesion of the lungs, pleura, intrathoracic glands, trachea or larynx;

(2) A nonrespiratory case should be one in which a tuberculous lesion is present in one or more parts of the body other than the lungs, pleura, intrathoracic glands, trachea or larnyx.

A case in which there are both respiratory and nonrespiratory lesions of clinical significance should be classified as a respiratory case.

III.—(1) Patients suffering from any form of tuberculosis should then be divided into:

Class A.—Viz., cases in which tubercle bacilli have never been discovered in any exudate, excrement, discharge or tissue.

Class B.—Viz., cases in which tubercle bacilli have been found at any time in any exudate, excrement, discharge or tissue.

A patient originally in class A (TB minus) should be transferred to class B (TB plus) at any stage in the course of treatment if and when tubercle bacilli are found, but, for purposes of classification at the time of first observation, if tubercle bacilli have not been found in any excreta or discharge prior to or during the first 8 weeks of observation or residential treatment, that patient should be considered an A case.

(2) In respiratory cases both classes A and B should be subdivided to give indication of:

(a) The extent and degree of the lesion.

(b) The degree of toxaemia.

The extent of the pulmonary lesion is best described by radiological zones as follows:

The upper zone.—That area above a straight line running through the lower borders of the anterior ends of the second ribs.

The middle zone.—That area bounded by the above line and one running through the lower borders of the anterior end of the fourth ribs.

The lower zone.—The remainder of the lung below the middle zone.

(3) Respiratory cases in both classes A and B should be further subdivided in three groups as follows:

Group 1.—Cases with slight constitutional disturbance, if any, e. g., there should not be marked acceleration of pulse or elevation of temperature except of very transient duration; gastro-intestinal disturbance or emaciation, if present, should not be excessive. Obvious physical signs and radiological findings should be of very limited extent. The physical signs should be either present in one lobe only, and in the case of an apical lesion of one upper lobe, not extending below the second rib in front or not exceeding an equivalent area in any one lobe; or, where these physical signs are present in more than one lobe, they should be limited to the apices of the upper lobes, and should not extend below the clavicle and the spine of the scapula.

Radiological findings should be limited to mottling involving a total area of not more than one zone.

No complications (tuberculous or other) of prognostic gravity should be present. A small area of dry pleurisy should not exclude a case from this group.

Group 3.—Cases with profound systemic disturbance or constitutional deterioration and with marked impairment of function, either local or general.

All cases with grave complications, whether they are tuberculous or not, should be classified in this group (e. g. diabetes, tuberculosis of intestines or larynx).

Group 2.—All cases which cannot be placed in groups 1 and 3.

(4) The classification indicated in the above paragraphs may be demonstrated diagrammatically as follows:

TUBERCULOSIS

R = Respiratory N. R. = Nonrespiratory

A1 A2 A3 B1 B2 B3 A B

As the classes A and B are defined by the success or failure to discover the tubercle bacilli in all cases of tuberculosis it is necessary to subdivide the nonrespiratory as well as the respiratory into these two classes. It is felt that by doing this the issue is clear-cut and no confusion can arise. The introduction, too, of radiological findings brings the classification into line with modern methods of diagnosis, but the value of other clinical methods has not been overlooked or discarded.

(5) *Pleural effusions.*—Uncomplicated cases of pleural effusion for which no alternative cause can be found should be regarded as tuberculous and placed in group 1 of class A and in group 1, class B, when tubercle bacilli have been demonstrated in the fluid.

(6) The single positive result. Where a single positive bacteriological report is not confirmed by further bacteriological search and is unsupported by clinical or radiological evidence of tuberculosis it may be ignored.

B. Results of Treatment

The following terms should be used to describe the results of treatment:

"*Quiescent.*"—Cases in which the general condition and exercise tolerance are good, having regard to the extent of the lesion; which show no evidence of toxaemia; in which no tubercle bacilli have been found on three consecutive monthly examinations by stained film; and in which changes revealed by other clinical investigations and by serial skiagrams point to retrogression of the tuberculous lesion.

"*Arrested.*"—Cases in which the disease has been "quiescent" for a continuous period of at least 2 years, or, if nonrespiratory, the disease is "quiescent" and there is reason to believe it is unlikely to recur.

"*Recovered.*"—Cases in which the state of quiescence has continued uninterruptedly for a period of 5 years.

C. Definition of Terms Employed in the Forms of Return

1. "*Dispensary register.*"—A list of all persons examined by the tuberculosis officer at or in connection with the dispensary, together with the names of any other persons accepted by the Tuberculosis Authority for residential treatment, or for observation in residential institutions, or for orthopaedic treatment or supervision under a scheme approved by the Minister of Health for the treatment of tuberculosis.

2. "*Adults.*"—All persons of the age of 15 years and upwards.

3. "*Patient.*"—A person suffering from tuberculosis whose name is included in the Dispensary Register.

4. "*Cases.*"—This term, when used without qualification, includes not only "patients" but also all doubtfully tuberculous persons whose diagnosis has not yet been completed.

5. "*New cases.*"—See directions for completing part (A) of the annual return.

6. "*Contacts.*"—Persons coming under review by reason of having lived, worked, or closely associated with a person who has notifiable tuberculosis.

7. "*Domiciliary treatment.*"—Treatment of an insured patient by his insurance practitioner on the recommendation of the tuberculosis officer.

D. Other Definitions of Terms of Documentary Significance

1. "*Active cases.*"—Those not quiescent. All cases discharging tubercle bacilli within the preceding 3 months should be considered as "active."

2. "*Stationary cases.*"—Cases in which the signs, symptoms, clinical tests and radiological appearances of the lesions have presented no material new features during the period under review.

3. "*Rehabilitation.*"—The remedial process which aims at restoring a patient to the maximum participation in a normal life commensurate with the degree of his disability.

93205/9/13

MINISTRY OF HEALTH,
May 1947.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED FEBRUARY 14, 1948

Summary

A slight net decline was reported in the incidence of influenza. A total of 12,418 cases was reported, as compared with 12,896 last week, 3,624 for the corresponding week last year, and a 5-year (1943–47) median of 5,376. Of the current total, 8 States in the South Atlantic, South Central, Mountain, and Pacific areas reported 11,123 cases, or 90 percent (last week 11,131), as follows (last week's figures in parentheses): *Increases*—Virginia 1,237 (1,016), Alabama 537 (500), Oregon 300 (137), California 1,234 (1,067); *decreases*—South Carolina 1,065 (1,269), Arkansas 491 (637), Texas 5,087 (5,133), Arizona 1,172 (1,372). No other State reported more than 169 cases. Of the total of 71,949 cases to date this year, 63,667 (88 percent) have been reported in 7 States in the areas named above, as follows: Virginia 5,888, South Carolina 6,627, Alabama 3,499, Arkansas 3,204, Texas 29,556, Arizona 7,372, and California 7,521. Only 1,465 cases (2 percent) have been reported in States outside these areas.

Of 33 cases of poliomyelitis reported (last week 28, 5-year median 32), New York, Florida, and Texas reported 4 each, and Michigan, South Carolina, and Oregon, 3 each.

Four cases of smallpox were reported during the week—1 each in Ohio, West Virginia, Kentucky, and Texas. California reported 4 cases of psittacosis, and Delaware 1 case of anthrax. Reports for the year to date of the dysenteries (combined), measles, tularemia, and undulant fever are above the respective median expectancies.

Deaths registered in 93 large cities of the United States during the week totaled 10,032, as compared with 10,718 last week, 10,007 and 10,063, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 10,007. For the 7-week period ended February 14, 73,296 deaths were recorded in the same cities, as compared with 70,037 for the corresponding period last year. Infant deaths for the week totaled 670, as compared with 751 last week and 665 for the 3-year median. The total to date is 5,040 as compared with 5,796 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Feb. 14, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47
	Feb. 14, 1948	Feb. 8, 1947		Feb. 14, 1948	Feb. 8, 1947		Feb. 14, 1948	Feb. 8, 1947		Feb. 14, 1948	Feb. 8, 1947	
NEW ENGLAND												
Maine	0	3	1	4	-------	-------	13	378	13	1	0	2
New Hampshire	0	1	0	-------	-------	-------	1	20	5	0	0	2
Vermont	0	2	0	-------	12	6	1	133	75	1	0	0
Massachusetts	2	19	7	-------	-------	-------	415	476	415	1	2	8
Rhode Island	0	0	0	1	1	2	2	75	59	0	0	3
Connecticut	0	0	0	1	1	4	25	286	207	1	0	5
MIDDLE ATLANTIC												
New York	12	27	14	[1] 8	[1] 4	[1] 14	789	142	1,272	9	14	26
New Jersey	10	1	4	-------	6	12	829	71	284	2	5	9
Pennsylvania	4	23	9	([2])	[2] 6	[2] 3	807	545	1,337	7	3	16
EAST NORTH CENTRAL												
Ohio	11	21	13	5	6	7	914	503	126	1	4	7
Indiana	18	8	5	20	3	15	722	41	229	0	1	2
Illinois	3	7	7	-------	-------	7	1,832	26	323	5	4	9
Michigan [3]	4	2	4	1	-------	4	1,296	92	215	0	2	7
Wisconsin	1	2	1	60	13	50	350	157	157	3	1	3
WEST NORTH CENTRAL												
Minnesota	3	7	7	-------	-------	1	370	32	28	2	1	1
Iowa	0	1	1	-------	-------	-------	907	11	29	0	1	1
Missouri	1	2	6	8	2	2	102	7	158	3	2	6
North Dakota	0	1	0	6	2	2	67	1	-------	0	1	1
South Dakota	2	0	2	-------	-------	-------	17	9	53	0	0	0
Nebraska	0	3	2	40	22	2	16	9	16	1	0	0
Kansas	0	6	5	169	15	14	7	7	185	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	-------	4	-------	61	2	16	0	0	0
Maryland [3]	2	12	10	3	2	23	60	58	58	1	4	4
District of Columbia	0	0	0	1	2	3	91	10	25	1	0	1
Virginia	1	6	8	1,237	371	827	88	218	173	3	3	10
West Virginia	3	4	3	121	65	28	243	97	31	0	0	2
North Carolina	9	3	9	-------	-------	-------	7	183	88	4	2	7
South Carolina	10	3	3	1,065	409	897	39	64	59	[4] 4	0	7
Georgia	9	9	8	26	26	75	44	188	131	2	4	3
Florida	8	4	4	19	5	3	71	13	29	1	1	4
EAST SOUTH CENTRAL												
Kentucky	6	5	6	2	1	6	24	1	47	1	4	5
Tennessee	5	6	7	107	26	58	82	88	88	9	2	6
Alabama	5	11	11	537	94	227	59	24	38	2	3	8
Mississippi [3]	1	5	5	104	-------	-------	28	-------	-------	0	2	4
WEST SOUTH CENTRAL												
Arkansas	3	2	7	491	62	205	81	74	112	0	3	3
Louisiana	5	0	8	50	1	7	229	-------	41	1	0	5
Oklahoma	2	7	2	157	90	199	29	-------	37	4	1	3
Texas	20	32	40	5,087	2,013	2,161	1,422	107	324	7	8	16
MOUNTAIN												
Montana	1	0	0	18	9	37	166	233	121	1	0	0
Idaho	1	0	0	54	13	13	22	7	10	1	0	0
Wyoming	1	0	0	-------	-------	4	38	4	24	0	0	0
Colorado	6	8	7	119	144	86	99	43	50	1	1	1
New Mexico	2	3	3	1	-------	1	17	60	28	0	0	1
Arizona	2	3	2	1,172	177	164	11	48	18	0	0	0
Utah [3]	4	0	0	131	1	50	17	11	54	0	0	1
Nevada	0	0	0	2	-------	-------	-------	-------	4	0	0	0
PACIFIC												
Washington	3	4	4	57	1	1	241	40	153	1	1	3
Oregon	5	1	3	300	4	15	50	46	112	3	3	3
California	4	35	30	1,234	11	99	594	169	556	22	9	25
Total	189	299	299	12,418	3,624	5,376	13,395	4,809	11,260	106	92	244
6 weeks	1,395	1,878	1,919	71,949	23,966	27,124	59,016	24,090	39,542	[4] 503	516	1,416
Seasonal low week [5]	(27th) July 5-11			(30th) July 26-Aug. 1			(35th) Aug. 30-Sept. 5			(37th) Sept. 13-19		
Total since low	7,753	9,444	10,467	115,507	56,941	56,941	93,962	46,977	65,666	[4] 1,285	1,488	3,248

[1] New York City only. [2] Philadelphia only. [3] Period ended earlier than Saturday.

[4] Correction (deducted from cumulative totals): Meningococcus meningitis, South Carolina, week ended January 24, 0 cases (instead of 1).

[5] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended Feb. 14, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47
	Feb. 14, 1948	Feb. 8, 1947		Feb. 14, 1948	Feb. 8, 1947		Feb. 14, 1948	Feb. 8, 1947		Feb. 14, 1948[6]	Feb. 8, 1947	
NEW ENGLAND												
Maine	0	0	0	15	34	34	0	0	0	0	0	0
New Hampshire	0	1	0	0	7	8	0	0	0	0	0	0
Vermont	0	1	0	0	3	15	0	0	0	0	0	0
Massachusetts	1	0	0	107	168	300	0	0	0	4	0	0
Rhode Island	0	1	0	10	18	21	0	0	0	0	0	0
Connecticut	0	0	1	26	39	59	0	0	0	1	0	0
MIDDLE ATLANTIC												
New York	4	2	2	222	388	505	0	0	0	2	2	1
New Jersey	0	1	0	76	149	140	0	0	0	2	1	1
Pennsylvania	2	2	1	262	215	303	0	0	0	2	4	6
EAST NORTH CENTRAL												
Ohio	0	3	1	314	327	310	1	0	0	3	0	1
Indiana	0	0	0	80	85	97	0	0	1	1	0	0
Illinois	1	2	1	127	130	273	0	0	0	3	3	2
Michigan [3]	3	1	1	153	118	154	0	0	0	3	0	1
Wisconsin	0	0	0	69	68	192	0	0	0	0	2	1
WEST NORTH CENTRAL												
Minnesota	0	3	0	57	40	58	0	0	0	1	0	0
Iowa	0	0	0	63	60	75	0	0	0	2	1	1
Missouri	0	1	1	39	41	93	0	0	0	0	0	0
North Dakota	0	0	0	4	6	15	0	0	0	0	0	0
South Dakota	0	0	0	4	8	19	0	0	0	0	0	0
Nebraska	1	0	0	16	35	35	0	0	0	0	1	0
Kansas	0	1	0	39	34	91	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	4	12	8	0	0	0	0	0	0
Maryland [3]	0	0	0	20	27	81	0	0	0	1	0	0
District of Columbia	0	0	0	14	14	28	0	0	0	2	0	0
Virginia	1	1	0	23	31	66	0	0	0	1	2	1
West Virginia	0	0	1	25	30	35	1	0	0	0	0	1
North Carolina	1	1	1	30	44	48	0	0	0	0	2	2
South Carolina	[7] 3	0	0	2	3	6	0	0	0	0	1	0
Georgia	1	0	0	16	19	21	0	0	0	4	0	2
Florida	4	4	1	11	17	11	0	0	0	0	2	1
EAST SOUTH CENTRAL												
Kentucky	0	0	1	46	45	54	1	0	0	0	1	0
Tennessee	1	0	1	37	44	48	0	0	0	0	1	0
Alabama	0	3	1	5	15	20	0	0	0	0	0	1
Mississippi [3]	0	0	0	6	9	10	0	0	0	0	1	1
WEST SOUTH CENTRAL												
Arkansas	0	1	0	5	5	7	0	0	0	0	4	1
Louisiana	0	0	0	6	1	7	0	0	0	3	0	3
Oklahoma	0	1	0	17	7	24	0	0	0	3	1	1
Texas	4	2	2	38	41	62	1	0	2	6	2	3
MOUNTAIN												
Montana	0	0	0	24	1	17	0	0	0	0	0	0
Idaho	1	0	0	3	13	18	0	0	0	0	0	0
Wyoming	0	0	0	3	7	6	0	0	0	0	0	0
Colorado	0	0	0	34	49	49	0	0	0	0	1	0
New Mexico	0	0	0	4	8	8	0	0	0	0	0	0
Arizona	0	0	0	6	11	21	0	0	0	0	0	0
Utah [3]	0	0	0	14	24	63	0	0	0	0	0	0
Nevada	0	0	0	0	2	2	0	0	0	0	0	0
PACIFIC												
Washington	1	0	2	61	34	34	0	0	0	0	1	1
Oregon	3	1	1	20	26	26	0	0	0	0	1	1
California	1	15	4	93	134	215	0	0	0	4	1	1
Total	33	48	32	2,250	2,646	3,823	4	0	7	48	35	43
6 weeks	[7] 221	406	246	12,977	15,039	22,010	20	23	51	248	254	292
Seasonal low week [5]	(11th) Mar. 15-21			(32nd) Aug. 9-15			(35th) Aug. 30-Sept. 5			(11th) Mar. 15-21		
Total since low	[7]10,432	25,203	13,617	35,516	41,725	60,331	41	77	134	3,657	3,782	4,928

[3] Period ended earlier than Saturday.

[5] Dates between which the approximate low week ends. The specific date will vary from year to year.

[6] Including paratyphoid fever reported separately, as follows: Massachusetts 4 (salmonella infection); New Jersey 1; Michigan 1; Maryland 1; Georgia 4; California 1.

[7] Delayed report (included in cumulative totals only): Poliomyelitis, South Carolina, week ended January 24, 1 case.

Telegraphic morbidity reports from State health officers for the week ended Feb. 14, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended Feb. 14, 1948							
	Week ended—		Median 1943–47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Feb. 14, 1948	Feb. 8, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	17	10	21	------	------	------	------	------	------	------	------
New Hampshire	1	------	6	------	------	------	------	------	------	------	------
Vermont	42	21	24	------	------	------	------	------	------	------	2
Massachusetts	96	197	117	------	5	------	------	------	------	------	------
Rhode Island	6	22	21	------	------	------	------	------	------	------	------
Connecticut	27	50	50	------	------	------	------	------	------	------	1
MIDDLE ATLANTIC											
New York	107	200	214	6	------	------	1	------	------	------	2
New Jersey	62	145	103	1	------	------	------	------	------	------	------
Pennsylvania	113	152	148	------	------	------	------	------	------	------	2
EAST NORTH CENTRAL											
Ohio	130	176	176	1	------	------	------	------	------	------	1
Indiana	37	27	24	------	------	------	1	------	------	------	2
Illinois	77	128	100	2	------	------	1	------	4	------	12
Michigan [3]	130	142	106	5	------	------	------	------	------	------	5
Wisconsin	126	162	102	------	------	------	------	------	------	------	2
WEST NORTH CENTRAL											
Minnesota	14	4	22	------	------	------	------	------	------	------	3
Iowa	7	11	11	------	------	------	------	------	------	------	3
Missouri	28	25	14	------	------	3	------	------	------	1	2
North Dakota	16	------	2	12	------	------	2	------	------	------	------
South Dakota	1	3	3	------	------	------	------	------	------	------	1
Nebraska	8	19	4	------	------	------	------	------	------	------	2
Kansas	41	18	26	------	------	------	------	------	1	------	9
SOUTH ATLANTIC											
Delaware	1	10	2	------	------	------	------	------	------	------	------
Maryland [3]	13	87	60	------	------	------	------	------	1	------	2
District of Columbia	8	1	6	------	------	------	------	------	------	------	1
Virginia	21	84	49	------	------	121	------	------	------	------	4
West Virginia	32	------	31	------	------	------	------	------	------	------	------
North Carolina	26	30	63	------	------	------	------	------	2	------	1
South Carolina	50	37	42	3	2	------	------	------	------	------	1
Georgia	9	7	9	------	4	------	------	------	1	2	8
Florida	13	41	15	1	------	1	------	------	------	1	------
EAST SOUTH CENTRAL											
Kentucky	9	29	38	------	------	------	------	------	------	------	------
Tennessee	14	25	25	1	------	------	1	------	1	------	2
Alabama	7	20	15	------	------	------	------	------	------	1	------
Mississippi [3]	2	------	------	3	------	------	------	------	1	1	------
WEST SOUTH CENTRAL											
Arkansas	24	7	21	6	------	------	------	------	1	------	1
Louisiana	2	6	3	1	------	------	------	------	3	1	1
Oklahoma	18	5	10	------	------	------	------	------	------	------	1
Texas	334	474	231	13	214	99	------	------	3	1	4
MOUNTAIN											
Montana	13	4	12	------	------	------	------	------	------	------	------
Idaho	7	1	4	------	------	------	------	------	------	------	------
Wyoming	4	1	2	------	------	------	------	------	------	------	------
Colorado	25	12	15	1	------	------	------	------	------	------	9
New Mexico	27	10	6	------	------	------	1	------	------	------	------
Arizona	22	34	29	------	------	14	------	------	------	------	3
Utah [3]	1	------	25	------	------	------	------	------	------	------	------
Nevada	------	------	------	------	------	------	------	------	------	------	------
PACIFIC											
Washington	26	44	28	1	------	------	------	------	------	------	------
Oregon	14	16	16	------	------	------	------	------	------	------	1
California	107	108	108	3	------	------	1	------	------	------	------
Total	1,921	2,605	2,304	60	225	238	8	0	18	8	83
Same week: 1947	2,605	------	------	77	231	127	10	0	40	38	120
Median, 1943–47	2,304	------	------	37	271	60	8	0	12	43	[8] 79
6 weeks: 1948	13,648	------	------	353	1,864	1,666	44	3	136	97	571
1947	14,728	------	------	262	2,391	1,380	42	1	298	307	539
Median, 1943–47	13,692	------	------	175	2,019	778	45	1	130	337	[8] 433

---

[3] Period ended earlier than Saturday.
[8] 3-year median 1945–47.

Anthrax: Delaware 1.
Psittacosis: California 4.

Territory of Hawaii: Bacillary dysentery 1; measles 1; whooping cough 25.
Alaska: German measles 1, chickenpox 2.

WEEKLY REPORTS FROM CITIES*

City reports for week ended Feb. 7, 1948

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	-------	0	2	0	0	0	0	9
New Hampshire:												
Concord	0	0	------	0	-------	0	1	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	-------	0	0	0	0	0	0	1
Massachusetts:												
Boston	4	0	------	1	320	1	5	0	34	0	1	14
Fall River	0	0	------	0	-------	0	0	0	0	0	0	2
Springfield	0	0	------	0	1	0	1	0	1	0	0	------
Worcester	0	0	------	0	-------	0	7	0	12	0	0	5
Rhode Island:												
Providence	0	0	------	0	1	1	7	0	1	0	0	2
Connecticut:												
Bridgeport	0	0	------	0	-------	0	0	0	11	0	0	------
Hartford	0	0	------	0	-------	0	2	0	1	0	0	3
New Haven	0	0	------	0	-------	0	1	0	0	0	0	------
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0	------	0	2	1	3	0	7	0	0	5
New York	10	0	2	0	606	3	82	0	74	0	1	34
Rochester	0	0	------	0	2	0	2	0	9	0	0	6
Syracuse	0	0	------	0	9	0	2	0	6	0	0	9
New Jersey:												
Camden	1	0	------	0	3	0	3	0	2	0	0	6
Newark	0	0	------	0	50	1	7	0	5	0	0	7
Trenton	1	0	------	0	-------	0	2	0	6	0	0	2
Pennsylvania:												
Philadelphia	2	0	2	0	109	1	20	0	63	0	0	23
Pittsburgh	0	0	2	2	-------	3	17	0	12	0	0	17
Reading	0	0	------	0	4	0	2	0	5	0	0	4
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	22	0	7	0	18	0	0	2
Cleveland	1	0	------	1	4	1	8	0	24	0	1	21
Columbus	0	1	1	1	108	0	1	0	2	0	0	5
Indiana:												
Fort Wayne	0	0	------	0	2	0	5	0	3	0	0	------
Indianapolis	1	1	3	5	158	0	6	0	2	0	0	1
South Bend	0	0	1	0	1	0	0	0	1	0	0	2
Terre Haute	0	0	------	0	53	0	3	0	0	0	0	------
Illinois:												
Chicago	0	0	1	0	556	1	25	0	54	0	0	33
Springfield	0	0	------	0	170	2	4	0	5	0	0	2
Michigan:												
Detroit	3	0	1	0	45	0	12	0	55	0	0	25
Flint	0	0	------	0	2	0	6	1	3	0	0	------
Grand Rapids	0	0	------	0	349	1	1	0	6	0	0	3
Wisconsin:												
Kenosha	0	0	------	0	55	0	0	0	0	0	0	2
Milwaukee	0	0	------	0	6	1	3	0	23	0	0	19
Racine	0	0	------	0	63	0	0	0	3	0	0	7
Superior	1	0	------	0	17	0	0	0	1	0	0	3
WEST NORTH CENTRAL												
Minnesota:												
Duluth	1	0	------	0	1	0	0	0	3	0	0	8
Minneapolis	0	0	------	0	153	0	8	0	13	0	0	12
St. Paul	0	0	------	0	16	0	6	0	3	0	0	9
Missouri:												
Kansas City	0	0	6	0	4	0	6	0	3	0	0	11
St. Joseph	0	0	------	0	-------	0	0	0	4	0	0	2
St. Louis	1	0	3	0	46	0	3	0	13	0	0	9

*In some instances the figures include nonresident cases.

ity reports for week ended Feb. 7, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	0	6	0	2	0	2	0	0	------
Kansas:												
Topeka	0	0	------	0	------	0	2	0	1	0	0	3
Wichita	0	0	------	0	------	0	3	0	2	0	0	14
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	35	0	2	0	2	0	0	3
Maryland:												
Baltimore	1	0	1	1	1	0	12	0	14	0	0	17
Cumberland	1	0	------	0	------	0	0	0	4	0	0	------
Frederick	0	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	86	2	8	0	13	0	0	4
Virginia:												
Richmond	0	0	------	1	------	0	3	0	5	0	0	3
Roanoke	0	0	------	0	------	0	0	0	0	0	0	------
West Virginia:												
Charleston	1	0	------	0	3	0	5	0	0	0	0	1
Wheeling	0	0	------	0	2	0	5	0	0	0	0	2
North Carolina:												
Raleigh	0	0	------	0	2	0	3	1	1	0	0	2
Wilmington	4	0	------	0	------	0	2	0	0	0	0	3
Winston-Salem	1	0	------	0	1	0	7	0	1	0	0	------
South Carolina:												
Charleston	2	0	123	0	------	1	3	0	0	0	0	11
Georgia:												
Atlanta	0	0	------	0	------	0	4	0	9	0	0	1
Brunswick	0	0	------	0	------	0	0	0	1	0	0	------
Savannah	0	0	22	1	------	0	2	0	2	0	0	------
Florida:												
Tampa	0	0	3	0	17	0	2	0	2	0	0	4
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	1	1	3	34	0	9	0	2	0	0	4
Nashville	0	0	------	3	1	0	8	0	5	0	0	------
Alabama:												
Birmingham	0	0	1	2	2	0	12	0	4	0	0	------
Mobile	0	0	1	1	------	1	2	0	1	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	1	0	------	0	2	0	2	0	0	2
Louisiana:												
New Orleans	2	0	2	0	------	0	5	0	3	0	0	2
Shreveport	0	0	------	0	------	0	10	0	1	0	0	------
Oklahoma:												
Oklahoma City	0	1	1	0	1	0	2	0	2	0	0	------
Texas:												
Dallas	0	0	------	1	1	0	11	0	0	0	0	7
Galveston	0	0	------	0	------	0	4	0	0	0	0	------
Houston	3	0	1	1	49	0	8	0	2	0	0	------
San Antonio	0	0	2	2	1	0	20	0	2	0	0	7
MOUNTAIN												
Montana:												
Billings	0	0	------	0	6	0	2	0	0	0	0	------
Great Falls	0	0	------	0	4	0	1	2	0	0	0	------
Helena	0	0	------	0	------	0	0	0	0	0	0	------
Missoula	0	0	------	0	------	0	0	0	0	0	0	------
Idaho:												
Boise	0	0	------	0	------	0	1	0	0	0	0	------
Colorado:												
Denver	2	0	8	0	50	0	2	0	6	0	0	23
Pueblo	0	0	------	0	1	0	0	0	2	0	0	23
Utah:												
Salt Lake City	1	0	------	0	12	0	2	0	5	0	0	------

City reports for week ended Feb. 7, 1948—Continued

Division, State and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	1	0		0	13	0	4	0	6	0	0	10
Spokane	0	0		0		0	1	0	3	0	0	
Tacoma	0	0		0	55	0	0	0	6	0	0	1
California:												
Los Angeles	2	0	96	3	28	0	4	0	20	0	0	6
Sacramento	0	0		0	1	0	1	0	3	0	0	3
San Francisco	2	1	41	2	150	3	16	0	11	0	2	5
Total	50	5	326	31	3,500	24	482	4	633	0	5	485
Corresponding week, 1947 [1]	98		70	21	1,089		386		712	0	6	762
Average 1943-47 [1]	80		301	[2] 36	[3] 3,312		[2] 449		1,271	0	11	651

[1] Exclusive of Oklahoma City. [2] 3-year average, 1945–47. [3] 5-year median, 1943–47.

Dysentery, amebic.—Cases: New York, 6; Reading 1; Chicago 1; New Orleans 1; Los Angeles 4.
Dysentery, bacillary.—Cases: Worcester 2; Philadelphia 1; Los Angeles 1.
Dysentery, unspecified.—Cases: Baltimore 4; San Antonio 2.
Tularemia.—Cases: St. Louis 1; New Orleans 2.
Typhus fever, endemic.—Cases: New Orleans 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (latest available estimated population, 34,563,100)

	Diphtheria cases rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	10.5	0.0	0.0	2.6	842	5.2	68.0	0.0	157	0.0	2.6	94
Middle Atlantic	6.9	0.0	2.8	0.9	363	4.2	64.8	0.0	87	0.0	0.5	52
East North Central	3.6	1.2	4.3	4.3	980	3.6	49.3	0.6	122	0.0	0.6	76
West North Central	4.0	0.0	18.1	0.0	455	0.0	100.6	0.0	88	0.0	0.0	135
South Atlantic	16.5	0.0	246.6	5.0	243	5.0	96.0	1.7	89	0.0	0.0	84
East South Central	0.0	5.9	17.7	53.1	218	5.9	183.0	0.0	71	0.0	0.0	24
West South Central	12.7	2.5	17.8	10.2	132	0.0	157.5	0.0	30	0.0	0.0	46
Mountain	23.8	0.0	63.5	0.0	580	0.0	63.5	15.9	103	0.0	0.0	365
Pacific	7.9	1.6	216.7	7.9	391	4.7	41.1	0.0	77	0.0	3.2	40
Total	7.6	0.8	49.3	4.7	529	3.6	72.9	0.6	96	0.0	0.8	73

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended January 31, 1948.—During the 4 weeks ended January 31, 1948, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chickenpox	29	Syphilis	104
Diphtheria	61	Tetanus	14
Dysentery, unspecified	13	Tuberculosis	767
Gonorrhea	256	Typhoid fever	7
Influenza	48	Typhus fever (murine)	3
Malaria	203	Whooping cough	116
Measles	815		

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended January 24, 1948.—During the week ended January 24, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Soctia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox	-	23	202	207	435	41	42	92	121	1,163
Diphtheria	-	-	1	18	3	1	-	-	-	23
Dysentery, amebic	-	-	-	10	2	-	-	-	-	12
German measles	-	-	-	5	23	9	1	7	5	50
Influenza	-	12	-	-	21	3	-	-	1	37
Measles	-	-	-	824	885	2	8	34	119	1,872
Meningitis, meningococcus	-	-	2	2	1	-	-	1	1	7
Mumps	-	16	-	244	206	49	99	45	23	682
Poliomyelitis	-	-	-	1	-	-	-	3	-	4
Scarlet fever	3	6	3	66	81	3	1	4	18	185
Tuberculosis (all forms)	-	6	14	131	33	15	14	-	29	242
Typhoid and paratyphoid fever	-	-	-	7	1	-	-	-	4	12
Undulant fever	-	-	-	4	2	-	-	-	-	6
Venereal diseases:										
Gonorrhea	3	10	15	102	86	32	27	48	75	398
Syphilis	1	10	7	45	54	9	13	5	31	175
Other forms	-	-	-	-	-	-	-	-	1	1
Whooping cough	-	-	1	45	13	17	1	41	23	141

MEXICO

Mexicali—Cerebrospinal meningitis.—As of January 19, 44 cases of cerebrospinal meningitis, with 3 deaths, had been reported in Mecicali, Mexico, since the outbreak there in December. It was stated that most of the patients had been in contact with Mexican agricultural workers who had returned from the United States. (See the Public Health Report for January 16, 1948, p. 95.)

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

Plague

Argentina—Buenos Aires Province—El Tigre.—For the period January 4–9, 1948, 3 cases of plague were reported in El Tigre, Buenos Aires Province, Argentina. El Tigre is located near the city of Buenos Aires.

British East Africa—Tanganyika— Singida District—Tintigula.—On January 9, 1948, 1 case of plague was reported in the village of Tintigula, Singida District, Tanganyika, British East Africa. This is the first reported case of plague in Tanganyika since the year 1941.

Peru.—During the month of December 1947, 7 cases of plague with 3 deaths were reported in Pativilca valley, Chancay Province, Lima Department, and 1 fatal case was reported in the city of Chiclayo, Lambayeque Department, Peru.

Smallpox

Dahomey.—For the period January 21–31, 1948, 43 cases of smallpox with 6 deaths were reported in Dahomey.

India—Calcutta.—For the week ended January 31, 1948, 370 cases of smallpox with 281 deaths were reported in Calcutta, India. For the week ended February 7, 526 cases of smallpox were reported.

Siam (Thailand)—Bangkok.—For the period January 18–31, 1948, 52 cases of smallpox were reported in Bangkok, Siam.

DEATHS DURING WEEK ENDED FEB. 7, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Feb. 7, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	10,718	9,663
Median for 3 prior years	9,953	
Total deaths, first 6 weeks of year	63,264	60,030
Deaths under 1 year of age	751	783
Median for 3 prior years	668	
Deaths under 1 year of age, first 6 weeks of year	4,370	4,970
Data from industrial insurance companies:		
Policies in force	66,880,436	67,295,456
Number of death claims	13,959	12,464
Death claims per 1,000 policies in force, annual rate	10.9	9.7
Death claims per 1,000 policies, first 6 weeks of year, annual rate	10.3	9.9

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON: 1948

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 MARCH 12, 1948 NUMBER 11

IN THIS ISSUE

Studies in Morbidity Reporting—I. Patterns
Field Tests With Tick Repellents

CONTENTS

Page

Morbidity reporting in local areas. I. Patterns of reporting. Margaret D. West 329
Field tests with tick repellents. James M. Brennan 339

INCIDENCE OF DISEASE

United States:

Reports from States for week ended February 21, 1948, and comparison with former years 347

Weekly reports from cities:

City reports for week ended February 14, 1948 351
Rates, by geographic divisions, for a group of selected cities 353

Foreign reports:

Canada—Provinces—Communicable diseases—week ended January 31, 1948 354
Cuba—
Habana—Communicable diseases—4 weeks ended January 31, 1948 354
Provinces—Notifiable diseases—4 weeks ended January 31, 1948 354
Finland—Notifiable diseases—December 1947 355
Guam—Encephalitis, Japanese "B" 355
Jamaica—Notifiable diseases—4 weeks ended January 31, 1948 355
Japan—Notifiable diseases—5 weeks ended January 31, 1948 355
Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—
Plague 356
Smallpox 356
Deaths during week ended February 14, 1948 356

Public Health Reports

Vol. 63 • MARCH 12, 1948 • *No. 11*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

MORBIDITY REPORTING IN LOCAL AREAS

I. Patterns of Reporting

By MARGARET D. WEST, *Public Health Analyst, United States Public Health Service* [1]

INTRODUCTION

Reporting of illness may be of public health importance for several reasons—to control the spread of disease, to aid the person suffering from a disease, to plan public health programs and to provide comprehensive information on the state of health of the population.

Health officers, epidemiologists and others using morbidity reports and statistics recognize that morbidity reporting at the present time has many defects, and falls short of meeting these objectives. The first problem here, is the measurement of the level of under-reporting (*1*).

In an initial effort to develop methods for the evaluation of morbidity reporting, and to develop recommendations for desirable requirements and procedures, studies have been made in five local areas presenting a variety of reporting problems. These studies, undertaken cooperatively with State and local health departments, covered sources of reporting, types of data collected, and supplemental source material available locally on unreported cases.

Basic to an evaluation of reporting is an understanding of the patterns of reporting in local health departments—the sources of reports, types of diagnoses, and the time elapsed between the onset of cases and their report to the health department. This paper will be limited to a discussion of these aspects of reporting. Supplemental source material and methods of evaluating completeness of reporting will be reviewed in subsequent papers.

MATERIAL

During the calendar year 1944 and 6 to 8 months of 1945, studies were undertaken in five areas representing widely varying population densities and types of health department organization. The areas ranged from a metropolitan area with a large and efficient health department and a well-integrated organization for the collection and analysis of morbidity reports to a rural county with a number of part-time health officers (only one of whom was a physician) and with one clerk who combined for two counties the function of administrator, secretary, and statistical staff.

---

[1] From the Division of Public Health Methods.

Area	Type	Estimated population (1943)
A	Urban	930,000
B	do	101,000
C	Urban and rural	70,000
D	do	63,000
E	Primarily rural	125,000

The 1945 study covered all reportable diseases (except venereal diseases) in all areas for the 6- to 8-month period. The exception was in area A where, because of the volume of reports, the study of German measles, chickenpox, and of mumps in children under 16 was limited to 7 weeks.

The 1944 study covered all reportable diseases (except venereal diseases) in areas C, D, and E. In area A, because of the volume of reports, it was limited to diphtheria, poliomyelitis, meningitis, pneumonia and rheumatic fever. Records on measles and whooping cough were not available for 1944 in area B.

Table 1 summarizes, by area, the number and diagnoses of cases reported by the local health department to the State in the 2 calendar years and the number of cases covered in the sample. The sample was not large enough to give significant information on infrequently occurring diseases. Furthermore, because of such factors as the epidemicity of certain diseases and the unavailability of certain records, the proportion of cases sampled varied greatly among diseases. Detailed discussion, therefore, has been limited to chickenpox, diphtheria, measles, meningitis, mumps, pneumonia, poliomyelitis, rheumatic fever, scarlet fever, tuberculosis, and whooping cough.

METHOD OF STUDY

After preliminary planning conferences with cooperating local organizations, a statistical clerk or medical record librarian was assigned, early in 1945, to the local health department in each of the five areas. Information recorded for each case covered the diagnosis, the source or sources which reported the case, the dates of the reports, laboratory diagnostic procedures employed, medical care and hospitalization received, as well as the age, sex, and residence of the patient.

To supplement this material similar data were secured from hospitals, schools, industrial plants, visiting nurse associations, Selective

TABLE 1.—*Reported cases of communicable diseases in five study areas, morbidity reporting study, 1944 and 1945*

Disease	Area A			Area B			Area C			Area D			Area E		
	Total cases reported	Sample		Total cases reported	Sample		Total cases reported	Sample		Total cases reported	Sample		Total cases reported	Sample	
		Number of cases	Percent of total		Number of cases	Percent of total		Number of cases	Percent of total		Number of cases	Percent of total		Number of cases	Percent of total
Total	38,489	8,860	--------	4,307	650	--------	831	705	--------	792	511	--------	2,201	1,961	--------
Chickenpox	6,070	798	13	NR	--------	--------	72	55	76	45	30	67	779	700	90
Diphtheria	614	433	71	37	28	76	2	2	100	14	2	14	10	8	80
Dysentery	84	9	11	--------	--------	--------	2	1	50	--------	--------	--------	--------	--------	--------
Encephalitis	1	1	100	--------	--------	--------	2	2	100	--------	--------	--------	--------	--------	--------
German measles	564	109	19	NR	--------	--------	2	2	100	--------	--------	--------	8	7	88
Influenza	365	14	4	--------	--------	--------	69	38	55	--------	--------	--------	2	2	100
Malaria	14	0	0	1	1	100	45	19	42	--------	--------	--------	--------	--------	--------
Measles	10,530	147	1	2,907	7	(1)	149	142	95	136	122	90	258	256	99
Meningitis, meningococcus	232	213	92	20	13	65	8	8	100	12	11	92	24	22	92
Mumps	3,632	662	18	NR	--------	--------	19	13	68	19	19	100	493	456	92
Pneumonia	2,734	1,985	73	NR	--------	--------	114	114	100	--------	--------	--------	29	27	93
Poliomyelitis	217	207	95	33	33	100	9	9	100	4	3	75	23	22	96
Rabies	--------	--------	--------	--------	--------	--------	1	1	100	--------	--------	--------	--------	--------	--------
Rheumatic fever	351	312	89	NR	--------	--------	6	6	100	NR	--------	--------	1	1	100
Rocky Mountain spotted fever	3	1	33	--------	--------	--------	--------	--------	--------	--------	--------	--------	8	7	88
Scarlet fever	4,499	1,400	31	126	84	67	149	131	88	309	174	56	293	269	92
Streptococcic sore throat	126	21	17	--------	--------	--------	15	13	87	1	1	100	--------	--------	--------
Trachoma	--------	--------	--------	--------	--------	--------	1	1	100	--------	--------	--------	--------	--------	--------
Trichinosis	3	2	67	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Tuberculosis	3,840	1,141	30	130	102	78	104	101	97	73	59	81	78	65	83
Tularemia	2	1	50	--------	--------	--------	4	3	75	--------	--------	--------	--------	--------	--------
Typhoid fever	26	22	85	4	3	75	4	4	100	12	11	92	9	8	89
Typhus fever	10	0	0	14	11	79	--------	--------	--------	--------	--------	--------	--------	--------	--------
Undulant fever	2	1	50	4	4	100	8	8	100	4	4	100	12	11	92
Vincent's angina	49	0	0	--------	--------	--------	4	2	50	--------	--------	--------	--------	--------	--------
Whooping cough	4,521	1,381	31	1,031	364	35	42	30	71	22	7	32	174	100	57

NR—Not reportable.

[1] Less than 0.5 percent.

TABLE 2.—*Total cases and percent reported by each source, 1944 and 1945 study period*

Reporting source	Disease (percent reported by each source)[1]										
	Chickenpox	Diphtheria	Measles	Meningitis, men.	Mumps	Pneumonia	Poliomyelitis	Rheumatic fever	Scarlet fever	Tuberculosis	Whooping cough
AREA A											
Number of cases	798	433	147	213	662	1,985	207	312	1,400	1,141	1,381
Private physician	44	24	71	7	89	16	27	5	87	26	46
Hospital [2]	4	8	7	31	9	46	8	83	7	21	20
Health department:											
Nurse	51	(3)	22	(3)	1				8	(3)	37
Other personnel	(3)	1	9		(3)			10	4		14
Clinic						1		(3)	(3)	28	
Laboratory		36	(3)			4			1	5	(3)
Communicable disease hospital	1	73	1	58	1	2	80	3	3	(3)	5
Mass survey										33	
Death certificate		3		13		35	(3)	(3)		6	(3)
School	1		1	1	(3)				(3)		1
Householder	1		1						1	(3)	2
Other	(3)		3			(3)		(3)	(3)	10	1
AREA B											
Number of cases	NR	28	7	13	NR	NR	33	NR	84	102	364
Private physician		79	57	85			88		69	11	9
Hospital		4		15			33			58	(3)
Health department:											
Nurse							3			1	16
Other personnel									4		
Clinic										32	
School									2		2
Householder		21	57	8			6		40		74
Other										2	
AREA C											
Number of cases	55	2	142	8	13	114	9	6	131	101	30
Private physician	98	100	100	62	100	67	89	17	99	67	100
Health Department:											
Nurse									1		
Laboratory		50				4		17	5	10	
Death certificate	2			50		48	11	83		48	
Other						1			1		
AREA D											
Number of cases	30	2	122	11	19	68	3	NR	174	59	7
Private physician	97	100	98	91	95	100	100		100	29	100
Hospital	3			18							
Health department:											
Nurse	3		2		5				1		
Other personnel											
Clinic										59	
Mass survey										27	
Death certificate				18							
Other										7	
AREA E											
Number of cases	700	8	256	22	456	27	22	1	269	65	100
Private physicians	48	100	56	86	36	78	95	100	92	14	72
Hospital				9		30				8	
Health department:											
Other personnel	5		2	5	2	4			3		11
Clinic										28	
School	25		38		59				3		14
Institution										54	
Householder	23		4		4				4		3
Other							5			5	

---

[1] Since one case may be reported by two or more sources, these figures may add to more than 100 percent.
[2] Exclusive of communicable disease hospital operated by health department.
[3] Less than 0.5 percent. NR—Not reportable.

Service, and welfare agencies. Data recorded through these channels were matched with health department data on reported cases, so that all information on each case was combined.

SOURCE OF REPORTS

Traditionally, health departments learn of the existence of a case of a notifiable disease from a report made by a physician to the health officer. All of the States included in the study require physicians, hospitals, householders, school teachers to report cases of notifiable diseases. In addition, certain of the areas require reporting by nurses and by persons in charge of food handling establishments, boarding houses, hotels, and institutions.

In practice, however, channels were found to be used only as the local health department encouraged and stimulated their use. The important sources of reporting, in the areas studied, were five—physicians, hospitals, schools, householders, and the health department itself. Four patterns were found in the five areas—with principal reporting by:

(1) Physicians (areas C and D),
(2) Physicians and schools (area E),
(3) Householders and physicians (area B),
(4) Physicians and health department (area A).

Figure 1 indicates the sources of reports in each of the study areas, adjusted for the sample, for all and for selected diseases. Table 2 shows the source of reports from each area for the diseases most frequently reported.

Physicians were the most important source of reports in four of the study areas. They constituted a secondary source only in area B.

Hospitals were an integral part of the reporting system only in area A, where several of the largest hospitals routinely reported through the hospital record room. Other hospitals in the area reported less frequently. In area B, reporting of poliomyelitis by the hopital was required. In the other areas only occasional reports were received from hospitals.

Schools were used as a reporting source only in area E and only in certain parts of that county. These reports with few exceptions represented a group of children for whom no physician reports were made. In this county 25 percent of the cases of chickenpox, 59 percent of mumps, and 38 percent of measles were reported by schools. A few cases of whooping cough and scarlet fever also were reported.

In areas A and B, the health department nurses secured information in the course of their visits to the schools, and school reporting is included in the nurses' reports.

Householders were the most important reporting source in area B, where the physicians frequently depended on householders to report to the health department for them. In other areas, only scattered reports were secured from householders.

The health department itself was found to take a very active part in the finding of cases only in area A—through follow-up of suspects and contacts by nurses or other staff members, through medical or laboratory diagnostic service, through well-baby, tuberculosis, and other clinics, through school health service, through mass case finding, and through checking death certificates.

Health officers came into the reporting picture in only two of the study areas. In area A, the health officer or an assistant visited 4 percent of the reported cases, usually as diagnostician. In area E, reports from physicians, schools, or householders were made through local sanitarians, or health officers, to the district (two-county) health department.

The health department nursing staff did some case finding and reporting in all areas. In area A, nurses made original reports on secondary cases of chickenpox, measles, whooping cough, and scarlet fever. In area B they made home follow-ups on many of the cases reported by householders, and reported a fair proportion of the whooping cough cases.

At the other extreme, in area E, the only nursing reports were made through the tuberculosis clinics, and nursing activity was limited almost entirely to tuberculosis and venereal disease control.

All areas but area C reported some cases through health department clinics. Two areas found cases through laboratory diagnostic service. The communicable disease hospital in area A which was under the direction of the health department routinely reported all cases admitted.

Many of the reported tuberculosis cases were found through mass surveys in areas A and D.

Death certificates were routinely used to find cases in areas A and C. Through this channel, cases of poliomyelitis, meningitis, pneumonia, tuberculosis, and rheumatic fever were reported. No case-finding check of vital records was made in area B. In area E, the local health department never saw a death record, since in that State vital records were sent from the local registrar direct to the State health department.

SOURCE OF SPECIFIC DISEASE REPORTS

In spite of the variation of reporting patterns among the study areas, typical patterns were found for individual diseases. Figure 1 indicates such patterns for the total and for four representative diseases.

Scarlet fever was reported almost entirely by private physicians.

Poliomyelitis, and meningococcus meningitis were reported primarily by physicians, with hospitals and death certificates as other important sources.

During the study period a regulation was adopted in area B requiring that physicians secure permission from the health department before a case of poliomyelitis could be hospitalized and that the hospital report the admission of such cases.

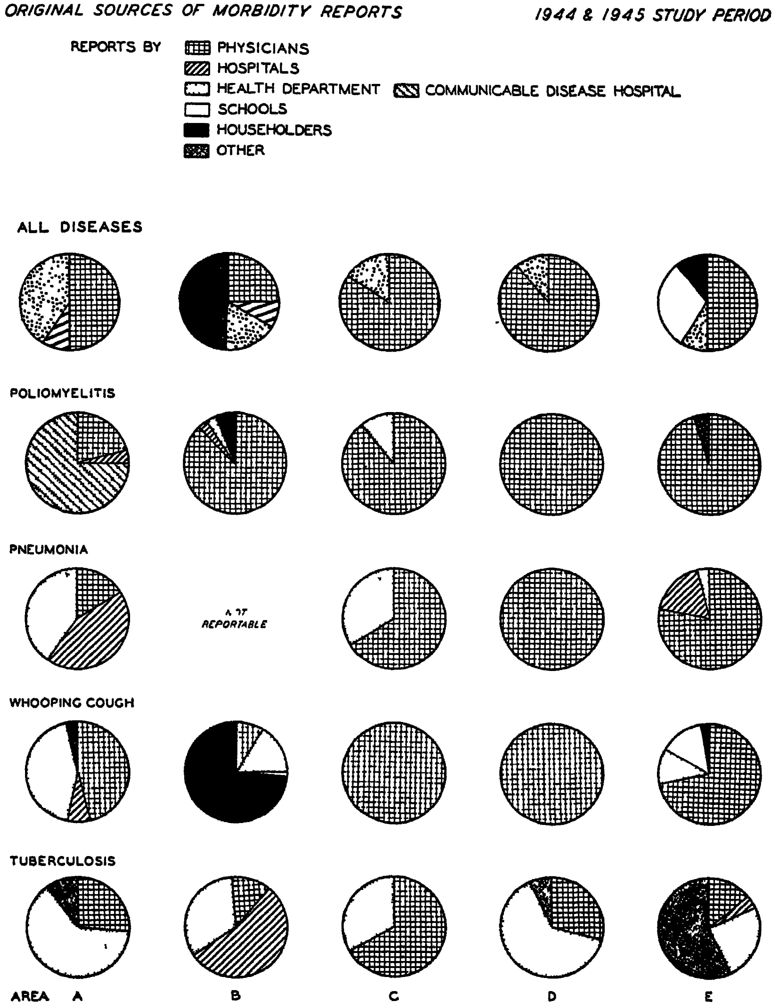


FIGURE 1.

Pneumonia and rheumatic fever, notifiable only in areas A, C, and E, were reported primarily by physician, hospital, and death certificate.

Diphtheria was reported primarily by private physicians, with laboratories, the communicable disease hospitals, and householders as supplementary sources.

Chickenpox, mumps, measles, and whooping cough were reported principally by private physicians, but health department nurses, schools, and householders were each important supplemental reporting sources. Chickenpox and mumps had been removed from the reportable list in area B shortly before the beginning of this study.

Tuberculosis reports came from the greatest variety of sources in all areas. Private physicians, clinics, hospitals, mass surveys and death certificates were especially important. Mass surveys were of course most important in the finding of minimal inactive cases, with clinics, physicians, hospitals, and death certificates increasing in importance as the severity of the cases increased. In area E more than half of the reports of tuberculosis cases were made by a large institution for the feeble-minded.

TYPE AND STAGE DISEASE REPORTED

A marked difference was found in definitions of certain diseases—legally and administratively. Only lobar pneumonia is reported in some places; in others broncho-pneumonia and virus pneumonia are also reported. A reported case of diphtheria in some areas is a clinical case; in another it may be a positive throat culture with no clinical symptoms. Poliomyelitis in some areas is reported only if paralytic symptoms are present, in others reports include abortive cases. Tuberculosis reports may cover reinfection cases only, or may include healed primary cases. Table 3 indicates such variations for pneumonia, poliomyelitis, and tuberculosis.

TABLE 3.—*Reported cases of pneumonia, poliomyelitis, and tuberculosis, by type or stage, 1944 and 1945 study period*

Diagnosis	Area A		Area B		Area C		Area D		Area E	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Pneumonia	1,985	100	NR	......	114	100	NR	......	27	100
Lobar	919	46	......	......	40	35	......	......	11	39
Broncho	482	24	......	......	39	34	......	......	5	19
Atypical (virus)	8	1	......	......	4	4	......	......	3	11
Hypostatic	......	......	......	......	7	6	......	......	......	......
Unspecified	576	29	......	......	24	21	......	......	8	31
Poliomyelitis	207	100	33	100	9	100	3	100	22	100
Paralytic	8	4	20	61	......	......	......	......	13	59
Nonparalytic	30	15	4	13	......	......	......	......	3	14
Unspecified	169	81	9	26	9	100	3	100	6	27
Tuberculosis	1,141	100	102	100	101	100	59	100	65	100
Reinfection—respiratory:										
Minimal inactive	351	31	1	1	2	2	24	40	1	2
Minimal active	136	12	12	12	5	5	10	17	4	6
Mod. advanced	254	22	23	22	......	......	13	22	6	9
Far advanced	221	19	53	52	1	1	4	7	11	17
Pleural effusion only	29	3	......	......	2	2	......	......	......	......
Other type	51	5	......	......	4	4	......	......	2	3
Primary	70	6	1	1	......	......	5	9	......	......
Unspecified	29	2	12	12	87	86	3	5	41	63

NR Not reportable.

MEDICAL AND NONMEDICAL DIAGNOSES

Morbidity reporting at best can cover only diagnosed cases of the disease. This study has demonstrated much variation in the interpretation of the word "diagnosed." One health jurisdiction may consider only a report signed by a physician as evidence of a diagnosed case. Another jurisdiction may accept nonmedical diagnoses on secondary cases in a household, if a medical diagnosis has been recorded for the first case. Still another will accept reports from householders or from school principals. In the latter instance, the physician may have told the mother who told the teacher who told the school nurse, or the case may never have been seen by a physician.

In areas A, C, and D, almost all reports were made by physicians or hospitals (table 4). In area E, which encouraged reporting by school authorities, only about half of the cases were reported by physicians or hospitals.

In area B, which encouraged reporting by householders, only about one-quarter of all cases were reported by physicians or hospitals.

TABLE 4.—*Type of morbidity report, 5 study areas, 1944–45*

Type of reports	Area				
	A	B	C	D	E
	Percent				
All reports	100	100	100	100	100
Medical	89	28	99	96	55
Nonmedical:					
With record of medical attendance	1	37	1	2	5
Without record of medical attendance	10	35	0	2	40

The nonmedical report of a disease in general was found to be most frequent for the two childhood diseases with a typical rash—chickenpox and measles—and somewhat less frequent for mumps and whooping cough. It was found very infrequently for the major diseases.

REPORTING LAG

Morbidity reports are published by the Public Health Service and often by the States, as cases reported, and therefore presumably occurrring, during a given week. There is a tendency to take the dates of published reports at their face value or to assume that the time between the date of report and of publication is a constant.

It was found, however, that neither of these assumptions is safe. Considerable time was often found to elapse between the onset or first symptoms of a disease, the calling of a physician, the establishment of a diagnosis, the filling out and mailing of a report card, and the tabulation of the reported data. Furthermore, this lag was far from constant. Great variation existed, both by area and by disease, in the time which elapsed between the onset of a case and the date on which it was reported.

While this variation in lag was obvious throughout the study, it was impossible to measure its exact extent because of gaps and omissions in local records. In some cases, information was available as to date of onset; in others, only to the physician's first visit. But the data available did indicate that the variations in reporting lag are important and need to be taken into account in interpreting published morbidity reports.

In general, reports were transmitted most quickly in area B, where the householder usually initiated the reporting. Second in order of promptness was area A, where the health department took considerable initiative in case finding.

In all areas, however, diseases with sudden onset and easily recognizable symptoms—scarlet fever, measles, chickenpox, diphtheria—were reported to the local health department relatively promptly, usually within a week after the onset. The less readily diagnosed whooping cough was usually reported during the second week of the case.

For pneumonia, the average case was reported during the 3d week in each of the three areas.

Table 5 summarizes the findings on reporting lags. In area B reports on scarlet fever, measles, and diphtheria were current reports. In the other study areas most reports on these diseases were for cases occurring a week earlier. Reports on whooping cough usually represented cases for the second previous week, while reports on pneumonia represented cases occurring during the third previous week.

TABLE 5.—*Average number of days elapsed between onset (or physician's first visit) and date case was reported to the State health department, 5 study areas, 1944–45*

Disease	Area				
	A	B	C	D	E
	Average number of days				
Scarlet fever	6.0	2.8	7.4	7.8	6.7
Measles	6.2	3.7	6.9	11.2	13.1
Chickenpox	8.3	----------	8.6	22.4	10.9
Diphtheria	8.5	3.9	7.0	7.0	6.7
Whooping cough	12.0	10.3	32.4	12.0	18.2
Pneumonia	16.4	----------	16.5	----------	17.7

SUMMARY

A study of morbidity reporting in five local areas revealed great variations in patterns. While physicians were the most important, and in some areas almost the only, reporting source it was found that in other areas hospitals, schools, householders, and health department staff members also were important reporting sources.

Within the pattern for each area there was considerable variation in the reporting sources for different types of diseases. Some diseases, particularly scarlet fever, were reported almost entirely by physicians. Reporting from other sources was most important for tuberculosis.

Two of the areas used only reports of cases diagnosed by physicians; the others received reports from a variety of sources. These differences existed both because of differing regulations and definitions as to what constitutes a report, and because of the policy and efforts of the health department in stimulating reporting from collateral sources.

The average lag between the onset of a case of a reportable disease and the report of that case to the State health department was found to vary considerably among areas and among diseases.

All of these differences in the pattern of reporting affect the comparability of the data at the State or national level. It also is evident that they are related to the completeness of reporting. It is planned to discuss these relationships and to develop indices of the completeness of reporting in subsequent papers.

REFERENCES

(*1*) Perrott, G. St. J.: Problems of morbidity reporting from the standpoint of national public-health activities. A. J. P. H. **35**: 698 (1945).

(*2*) Ciocco, Antonio, West, Margaret D., and Altenderfer, Marion E.: State variation in the collection of reportable disease statistics. A. J. P. H. **36**: 384 (1946).

FIELD TESTS WITH TICK REPELLENTS [1]

By JAMES M. BRENNAN, *Entomologist, United States Public Health Service*

The results of preliminary laboratory tests of certain organic materials as tick repellents were published in the PUBLIC HEALTH REPORTS, August 8, 1947. Those which showed most promise and were available in sufficient quantity (N-n-butylacetanilide, 1-benzyl cyclohexanol-1, 2-phenyl cyclohexanol, benzyl benzoate, dimethyl phthalate, dibutyl phthalate, 6–2–2 mixture, and phthalic acid-hexahydro-diethyl ester) have subsequently been tested under field conditions, with Army cooperation, at Camp Bullis, Tex., June 1947.

---

[1] From the Rocky Mountain Laboratory (Hamilton, Montana), of the Division of Infectious Diseases, National Institute of Health.

This area was selected because of the local abundance of the lone star tick, *Amblyomma americanum*.[2]

Enlisted men from the 32d Medical Battalion, Brooke Army Medical Center, Fort Sam Houston, Tex., served as test subjects. Except for a few key men, it was not possible to retain the same personnel throughout the entire 4 weeks of observations, which made frequent replacements necessary.

The data obtained concerned only nymphal and adult ticks, since the larvae were not sufficiently prevalent to provide significant information. Two series of tests were performed.

TEST PROCEDURES

In the first series of tests, 20 men wearing treated and untreated regulation fatigue uniforms were exposed to heavy tick infestations for approximately 4 hours per day. Sixteen uniforms were treated in pairs, each pair with a different repellent, while four were left untreated as controls. Freshly laundered garments were impregnated, once only, from a solvent (acetone) with 2 ounces of repellent per uniform. Since trousers were tucked in combat boots, socks were untreated. For obvious reasons the test subjects were not told which uniforms were treated and which were untreated.

The repellents were evaluated by comparing the numbers of ticks on treated and untreated uniforms. The ticks were removed and counted hourly. Percent repellency was derived from the reduction in the average number of ticks recorded on treated clothing per man per day below the average number on untreated clothing, and may be expressed by the equation $R=\frac{U-T}{U}$ x 100, where R=percent repellency, U=number of ticks on untreated clothing, and T=number of ticks on treated clothing.

Test clothing was worn for approximately 8 hours daily, and when not in use was folded or rolled and stored in the laboratory. Requirements exacted from the test subjects were that underwear, at least shorts, must be worn; that they be exposed to the greatest possible number of ticks during a 4-hour test period; and that no ticks be removed from their persons except under supervision. No restrictions were placed on their activities. They were at liberty to move about, sit, or recline. Card playing and reading were encouraged.

---

[2] The project at Camp Bullis, approved by Gen. Jonathan M. Wainwright, commanding, Fourth Army, was conducted with the aid of various military organizations at Fort Sam Houston.

Experiments were performed with the technical assistance of First Lt. Herbert C. Barnett, Medical Field Service School, through the cooperation of his commanding officer, Lt. Col. Gottlieb L. Orth.

The author is indebted to Brig. Gen. John W. Willis, commanding, Brooke Army Medical Center, and Col. E. H. Gist, post surgeon, for the many courtesies extended and facilities provided; to the Dow Chemical Co. for N-n-butylacetanilide and 2-phenyl cyclohexanol; to the Monsanto Chemical Co. for dibutyl phthalate; to the Army Chemical Corps for benzyl benzoate and 1-benzyl cyclohexanol-1, the latter having been synthesized especially for this purpose; to the laboratory of the United States Bureau of Entomology and Plant Quarantine, Orlando, Fla., for phthalic acid-hexahydro-diethyl ester; and to the Chemical-Biological Coordination Center of the National Research Council for much valuable assistance in the procurement of many materials which were used in these and initial screening tests.

The writer is particularly grateful to the enlisted men of the 32d Medical Battalion, who exposed themselves to ticks.

The second series of tests was, in substance, a repetition of the first, except that a comparison was made of dosages of 1 and 2 ounces per uniform and fewer materials were tested. Twenty uniforms were impregnated in lots of four, each lot with a different repellent, half with 2 ounces and half with 1 ounce, while five were left untreated as controls. To avoid dissatisfaction among the men and to minimize inconsistencies in test data, untreated uniforms were rotated so that each man wore an untreated uniform every fifth day.

TEST DATA

The data for the two series of tests are given in tables 1 and 2, respectively.

As might be expected, under conditions involving variables which could not be eliminated, the results of the tests were not wholly consistent, but none the less were strongly indicative of the relative repellent value of the various materials. While the effectiveness of all test materials was reduced (tables 1 and 2) as a result of aging, wear and other factors influencing their chemical breakdown, this reduction was not constant. Similarly, the difference in the degree of protection from nymphs and adults and at dosages of 1 and 2 ounces, while perceptible, was not constant.

In evaluating the tabular data, the daily fluctuation in the average number of ticks recorded on untreated uniforms is to be considered. This count averaged lower and was more erratic in the first series of tests than in the second, therefore it is believed that the data in table 2 are somewhat more significant.

In the first series no records were obtained for 6–2–2 and dibutyl phthalate on the fourth day because the full complement of men was not present, and in the second series the observations on 6–2–2 and benzyl benzoate were discontinued after the fifth day, both because of their erratic performance and the desire to give more attention to the effects of wear on the chemicals which appeared more promising.

Only two compounds, butylacetanilide and phthalic acid-hexahydrodiethyl ester afforded complete protection against both nymphal and adult ticks on the first day after impregnation in the first series, and only the former on any subsequent days in both series. While none of the materials at a dosage of 1 ounce gave complete protection from both nymphs and adults, butylacetanilide, benzyl cyclohexanol and phenyl cyclohexanol did give a high degree of protection (more than 90 percent) on several different days (table 2).

TABLE 1.—*Percent repellency to* Amblyomma americanum *of materials tested at a dosage of 2 ounces per uniform*

Test days (by number of day after treatment)	N-n-butyl-acetanilide		1-Benzyl cyclo-hexanol-1		2-Phenyl cyclo-hexanol		Benzyl benzoate		6-2-2 mixture		Dibutyl phthalate		Dimethyl phthalate		Phthalic acid-hexahydro-di-ethyl ester		Control: Average ticks per man on untreated uniforms	
	Percent repellency																	
	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs
1st	100	100	50	100	80	91	80	91	60	95	100	95	50	82	100	100	5	11
2d	94	93	88	97	58	65	44	79	40	81	35	47	83	89	98	99	26	98
3d	91	89	95	100	98	97	84	75	61	55	0	69	91	80	69	87	32	75
4th	100	100	88	91	0	45	69	92					81	79	6	0	8	98
7th	82	94	68	57	0	0	36	77	50	44	0	73	18	69	36	62	11	58
8th	89	96	0	54	0	0	100	92	94	81	17	84	39	79	61	84	9	96
9th	79	77	21	0	0	0	43	52	64	48	57	57	75	74	46	35	14	41
10th	100	89	0	0	0	0	50	0	0	0	40	53	90	95	80	0	5	19
	Average percent repellency																	
First 4 days	94	95	89	96	65	65	68	83	[1] 52	[1] 71	[1] 15	[1] 59	84	83	75	60		
Last 4 days	85	91	17	2	0	0	55	68	56	47	6	74	53	78	51	36		
Total—8 days	90	93	63	56	10	0	63	77	[2] 54	[2] 58	[2] 12	[2] 67	73	81	66	49		

[1] 3 days average.
[2] 7 days average.

TABLE 2.—*Percent repellency to* Amblyomma americanum *of materials tested at dosages of 1 ounce and 2 ounces per uniform*

Test days (by number of day after treatment)	N-n-butylacetanilide				1-Benzyl cyclohexanol-1				2-Phenyl cyclohexanol				Benzyl benzoate				6-2-2 mixture				Control: Average ticks per man on untreated uniforms	
	1 Ounce		2 Ounces		1 Ounce		2 Ounces		1 Ounce		2 Ounces		1 Ounce		2 Ounces		1 Ounce		2 Ounces			
	Percent repellency																					
	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs
3d	99	95	97	100	57	76	94	99	94	94	90	99	74	0	76	68	53	53	82	81	34	101
4th	96	98	100	99	79	92	100	99	88	99	100	99	73	80	71	78	31	88	0	61	26	204
5th	86	99	100	100	80	94	98	99	96	91	98	99	88	90	92	95	74	92	0	75	25	171
6th	96	100	100	100	100	98	98	97	42	56	56	92	23	74	96	95	21	73	67	86	24	133
7th	83	91	83	99	92	92	89	97	44	48	63	78	67	68	33	79	50	67	67	76	18	75
10th	76	95	100	99	62	73	47	67	35	43	65	98	------	------	------	------	------	------	------	------	17	41
11th	87	90	96	100	43	65	78	92	48	58	76	56	------	------	------	------	------	------	------	------	23	89
12th	94	96	95	81	55	76	61	91	80	35	64	57	------	------	------	------	------	------	------	------	33	70
13th	89	96	91	94	8	19	44	52	72	65	84	80	------	------	------	------	------	------	------	------	32	81
14th	67	90	89	96	0	0	22	24	67	69	44	63	------	------	------	------	------	------	------	------	9	49
	Average percent repellency																					
First 5 days	93	97	97	99	79	92	96	98	76	84	83	96	66	68	76	84	47	79	35	76	------	------
Last 5 days	86	93	94	94	28	46	54	69	64	54	71	68	------	------	------	------	------	------	------	------	------	------
Total—10 days	90	96	96	98	55	77	77	89	70	74	77	87	------	------	------	------	------	------	------	------	------	------

In the 8 days of wear in the first series of tests (table 1), 90 percent or greater protection from ticks was given by 2-ounce impregnations as follows: butylacetanilide afforded protection from adults and nymphs on 5 test days; benzyl cyclohexanol—adults on 1 test day, nymphs on 4 test days; phenylcyclohexanol—adults on 1 test day, nymphs on 2 days; benzyl benzoate on 1 and 3 days; 6–2–2 and dibutyl phthalate on 1 and 1 days; dimethyl phthalate on 2 and 1 days; and phthalic acid-hexahydro-diethyl ester on 2 and 2 days. The highest average protection throughout the 8-day test period was obtained from butylacetanilide. Benzyl cyclohexanol, while giving higher average protection than the remaining materials during the first 4 days of wear, gave considerably lower average protection against both adults and nymphs than dimethyl phthalate and slightly lower average protection against nymphs than benzyl benzoate for the entire period. Phenyl cyclohexanol afforded the lowest average protection during the 8 days of wear.

In the 10 days of wear in the second series (table 2), 90 percent or greater protection was afforded against adults and nymphs respectively, with a dosage of 2 ounces, by butylacetanilide on 8 and 9 test days; benzyl cyclohexanol on 4 and 7 days; phenyl cyclohexanol on 3 and 5 days; and benzyl benzoate (5-day observation) on 2 and 2 days. With a dosage of 1 ounce: butylacetanilide on 4 and 10 test days; benzyl cyclohexanol on 2 and 4 days; phenyl cyclohexanol on 2 and 3 days; benzyl benzoate (5-day observation) on 0 and 1 days; 6-2-2 (5 day-observation) on 0 and 1 days. Butylacetanilide provided the highest average protection throughout 10 days of wear. Benzyl cyclohexanol gave a higher average protection than the remaining materials during the first 5 days and, at a dosage of 2 ounces, for the entire period. Phenyl cyclohexanol, while unexplainably deficient in the first series, afforded a higher average protection than benzyl benzoate and 6-2-2 for the first 5 days and, at a dosage of 1 ounce, higher average protection for the 10 days than benzyl cyclohexanol.

It is apparent that all materials afforded a somewhat higher degree of protection against nymphs than adults (tables 1 and 2). However, in the first series, benzyl cyclohexanol, phenyl cyclohexanol, and phthalic acid-hexahydro-diethyl ester showed a higher average protection from adults, but only subsequent to their marked reduction in effectiveness; i. e., after 4, 3, and 3 days respectively. From table 2 it is indicated that a dosage of 2 ounces gave greater protection than 1 ounce, with the exception of 6-2-2 of which the results were too erratic to be of much significance.

DISCUSSION

All materials tested gave some degree of protection. From the standpoint of maximum repellency it is at once apparent that butylacetanilide and benzyl cyclohexanol consistently rate first and second respectively in all tests.

From a comparison of the tabulated data it will be noted (1) that reasonably consistent results were obtained from butylacetanilide throughout both series of tests, (2) that this compound gave adequate to excellent protection against both nymphs and adults of *Amblyomma americanum* at dosages of both 1 and 2 ounces for 10 days of wear, and (3) that the end-point for persistence of its effectiveness was apparently not reached.

The data for the first series of tests suggest that benzyl cyclohexanol and phenyl cyclohexanol, while somewhat inconsistent in performance, were promising. In the second series both chemicals, at a dosage of 2 ounces, were almost equally as effective as butylacetanilide for the first few days of wear, but the effectiveness of benzyl cyclohexanol was greatly reduced after the fifth day and that of phenyl cyclohexanol after the third day.

Phthalic acid-hexahydro-diethyl ester, which showed promise of affording adequate protection up to 3 days, was not available for further testing.

In the first series, benzyl benzoate and dimethyl phthalate, while having given reasonable protection from nymphs, were quite erratic in their performance against adults, and in the second series, insofar as observed, the results from benzyl benzoate were compatible with those of the first. Both materials in the first tests were more persistent in effectiveness than benzyl cyclohexanol and phenyl cyclohexanol.

Dibutyl phthalate and the 6-2-2-mixture provided insufficient protection and were erratic in performance in all tests.

As noted in an earlier report (*loc. cit.*) butylacetanilide does not stain fabrics and does not have an objectionable odor. Although no data are available on its toxicity, the related compounds N-n-ethylacetanilide and N-n-propylacetanilide have been tested by the United States Food and Drug Administration and pronounced safe from the standpoint of irritation to the skin. Furthermore, there was no evidence of dermatitis or other objectionable reaction among 29 persons wearing garments or socks impregnated with this compound.

Where the impregnation of clothing by use of solvents is not feasible, treatment may be accomplished equally as well, and also more economically, by use of aqueous emulsions. Laboratory tests have shown that 5 percent emulsions of butylacetanilide in 1-percent solutions of sodium oleate, Tween 80, Triton X-500, Triton 720, or Triton 770, or in a 2-percent solution of laundry soap do not break after several weeks standing, hence are sufficiently stable for practical purposes. Clothing dipped in an emulsion of this concentration takes up the amount of repellent required to provide adequate protection.

INCIDENTAL OBSERVATIONS ON N-N-BUTYLACETANILIDE AGAINST MITES

Occasional observations suggested that butylacetanilide affords complete protection from our two common species of man-infesting chiggers, *Eutrombicula alfreddugesi* and *E. masoni*. Although no controlled tests were performed, it was noted that the larvae of these mites when placed on impregnated clothing appeared to be immobilized in 4 to 10 seconds, often more rapidly than they could be brought into the focus of a lens.

While on a field assignment in western Arkansas, after leaving Camp Bullis, the writer was exposed to moderate populations of all stages of the lone star tick and very heavy chigger populations for 8 days. Only trousers and socks were treated with butylacetanilide. No tick or chigger bites were received during the period.

CONCLUSIONS

Butylacetanilide, having shown excellent repellency against both nymphs and adults of *Amblyomma americanum* for 10 days, is the best of the materials tested from the standpoint of maximum repellency, highest average protection, persistence of effectiveness and consistent performance. Its value for practical application as a tick repellent is strongly indicated, while incidental observations have suggested that it affords complete protection against chiggers. No data are available on its toxicity, but related compounds have been pronounced safe, and in tests described here on 29 persons no objectionable reactions were found.

Benzyl cyclohexanol and phenyl cyclohexanol, while less persistent in effectiveness, gave evidence of adequate protection for 5 and 3 days, respectively. Their possible usefulness is suggested.

Although erratic in performance and not giving the desired amount of protection, the use of benzyl benzoate and dimethyl phthalate, especially in the absence of the more promising compounds (both materials being readily available) is suggested.

Because of insufficient protection or erratic performance, or both, the use of dibutyl phthalate and the 6–2–2 mixture is not indicated.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED FEBRUARY 21, 1948

Summary

For the third consecutive week a decline was reported in the incidence of influenza—from 12,418 to 11,234 cases for the current week, as compared with 3,459 for the corresponding week last year and 4,472 for the median of the corresponding weeks of the years 1943–1947. The 9 States reporting currently 10,133 cases (90 percent, last week 11,180 cases), are as follows (last week's figures in parentheses): *Increases*—Alabama 589 (537), Arkansas 575 (491), Washington 832 (57), Oregon 635 (300), California 1,420 (1,234); *decreases*—Virginia 556 (1,237), South Carolina 1,059 (1,065), Texas 3,834 (5,087), Arizona 633 (1,172). Only 3 other States reported more than 98 cases—Georgia 178 (last week 26), Tennessee 146 (last week 107), and Louisiana 124 (last week 50). The total for the year to date is 83,183, as compared with 31,258 for the 5-year median, 27,425 for the same period last year, which was the lowest number recorded for a corresponding period of the past 5 years, and 294,840, the highest, in 1944.

Of 31 cases of poliomyelitis reported for the week (same week last year 43, 5-year median 33), Florida reported 4 (last week 4), and New York, Ohio, and California 3 each. The total for the year to date is 253, as compared with 449 for the same period last year (the highest in the past 5 years), and a 5-year median of 288.

Two cases of smallpox were reported—1 each in Louisiana and Colorado. Of 7 cases of anthrax, Pennsylvania reported 3, New Jersey 2, and Connecticut and New York 1 each. New York reported 2 cases of leprosy and California 1 case, and Illinois and North Carolina each reported 1 case of Rocky Mountain spotted fever. Reports for the year to date are above the median expectancies for the dysenteries (combined), influenza, measles, Rocky Mountain spotted fever, and undulant fever.

Deaths registered during the week in 93 large cities of the United States totaled 10,655, as compared with 10,032 last week 9,741 and 9,474, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 9,474. For the 8-week period ended February 21, the total is 83,951, as compared with 79,778 for the corresponding period last year. Infant deaths totaled 776, as compared with 670 last week and a 3-year median of 594. The total to date is 5,816, as compared with 6,581 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended February 21, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that although none was reported cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median, 1943–47	Week ended—		Median, 1943–47	Week ended—		Median, 1943–47	Week ended—		Median, 1943–47
	Feb. 21, 1948	Feb. 15, 1947		Feb. 21, 1948	Feb. 15, 1947		Feb. 21, 1948	Feb. 15, 1947		Feb. 21, 1948	Feb. 15, 1947	
NEW ENGLAND												
Maine	0	6	1	1	3	2	3	309	14	0	1	1
New Hampshire	0	0	0	------	2	------	------	11	9	0	0	0
Vermont	0	1	1	------	------	------	------	124	94	0	0	0
Massachusetts	8	12	5	------	------	------	754	634	462	6	3	7
Rhode Island	0	1	0	------	------	------	1	141	16	0	0	0
Connecticut	0	1	0	------	2	4	58	626	320	3	0	2
MIDDLE ATLANTIC												
New York	12	17	15	[1] 11	[1] 12	[1] 7	1,563	133	1,102	12	9	32
New Jersey	1	3	3	12	5	12	1,257	125	425	3	1	6
Pennsylvania	3	10	10	(2)	[2] 3	[2] 4	972	516	1,080	2	8	21
EAST NORTH CENTRAL												
Ohio	14	14	10	7	7	11	1,077	532	154	2	4	6
Indiana	10	17	15	23	8	34	438	35	175	1	2	6
Illinois	1	3	9	1	1	5	2,649	50	506	3	6	16
Michigan [3]	3	8	7	3	1	2	1,495	260	260	6	3	5
Wisconsin	4	5	3	58	54	56	506	154	328	3	0	5
WEST NORTH CENTRAL												
Minnesota	3	5	4	------	------	------	338	63	48	2	1	3
Iowa	1	4	4	3	------	------	562	30	47	2	2	4
Missouri	4	6	6	10	8	5	204	4	212	1	2	7
North Dakota	1	2	1	------	30	10	34	1	3	0	1	1
South Dakota	0	3	3	------	------	------	10	6	66	0	1	0
Nebraska	0	4	3	2	------	26	28	3	82	2	0	1
Kansas	4	5	6	29	3	9	6	3	333	2	0	4
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	42	3	8	2	0	1
Maryland [3]	7	4	6	11	4	8	63	37	75	1	1	4
District of Columbia	0	0	0	------	2	2	96	13	48	0	0	2
Virginia	2	10	10	556	490	559	78	245	257	2	3	7
West Virginia	3	6	5	82	41	29	191	95	37	0	0	2
North Carolina	7	14	12	------	------	------	------	478	254	0	2	7
South Carolina	5	1	2	1,059	426	687	95	43	43	1	0	5
Georgia	6	5	5	178	20	139	34	127	127	1	1	1
Florida	11	7	5	25	10	10	97	4	23	0	1	2
EAST SOUTH CENTRAL												
Kentucky	7	11	8	3	------	10	41	15	15	3	1	4
Tennessee	2	2	5	146	25	101	133	27	125	3	1	6
Alabama	3	1	7	589	43	188	196	25	28	6	2	4
Mississippi [3]	7	7	6	54	------	------	66	------	------	0	0	4
WEST SOUTH CENTRAL												
Arkansas	6	4	5	575	69	145	128	34	60	1	1	2
Louisiana	1	1	7	124	6	21	206	23	84	8	0	4
Oklahoma	4	5	5	84	147	248	1	3	41	5	3	4
Texas	25	25	38	3,834	1,761	2,043	1,435	100	379	5	3	13
MOUNTAIN												
Montana	0	0	0	27	26	25	110	256	248	0	0	0
Idaho	13	0	1	19	4	------	22	5	53	0	0	0
Wyoming	0	1	1	------	6	6	61	10	19	0	0	0
Colorado	3	10	7	98	140	83	136	45	191	1	2	2
New Mexico	1	5	2	9	1	2	17	38	21	0	1	0
Arizona	20	4	3	633	64	144	13	64	22	0	0	0
Utah [3]	0	0	0	80	13	57	33	8	82	0	0	0
Nevada	0	0	0	1	------	------	------	------	1	0	0	0
PACIFIC												
Washington	1	4	4	832	1	1	164	27	215	0	2	4
Oregon	0	4	4	635	5	28	27	57	84	0	0	2
California	4	30	30	1,420	16	103	660	238	621	9	4	19
Total	207	288	288	11,234	3,459	4,472	16,100	5,780	13,932	98	72	281
7 weeks	1,602	2,166	2,186	83,183	27,425	31,258	75,116	29,870	53,474	601	588	1,697
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	7,960	9,732	10,776	126,741	60,400	61,160	110,062	52,757	79,598	1,383	1,560	3,646

[1] New York city only.

[2] Philadelphia only.

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended February 21, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	Feb. 21, 1948	Feb. 15, 1947		Feb. 21, 1948	Feb. 15, 1947		Feb. 21, 1948	Feb. 15, 1947		Feb. 21, 1948[5]	Feb. 15, 1947	
NEW ENGLAND												
Maine	0	0	0	6	13	28	0	0	0	0	0	1
New Hampshire	0	0	0	2	0	8	0	0	0	0	0	0
Vermont	0	0	0	1	11	11	0	0	0	0	0	0
Massachusetts	0	0	0	125	177	312	0	0	0	0	2	2
Rhode Island	0	0	0	6	18	17	0	0	0	0	0	0
Connecticut	0	0	0	33	36	72	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	3	2	2	338	338	507	0	0	0	1	2	2
New Jersey	2	1	0	80	109	139	0	0	0	1	0	1
Pennsylvania	0	0	0	276	259	318	0	0	0	4	4	4
EAST NORTH CENTRAL												
Ohio	3	1	0	395	364	364	0	0	0	3	2	2
Indiana	0	2	1	93	124	124	0	1	1	1	2	2
Illinois	1	0	0	148	150	272	0	0	0	0	3	2
Michigan [3]	0	4	0	172	121	134	0	0	0	0	0	0
Wisconsin	0	1	0	72	68	210	0	0	0	0	1	0
WEST NORTH CENTRAL												
Minnesota	0	1	0	45	51	62	0	0	0	0	0	0
Iowa	0	2	0	49	53	60	0	0	1	0	0	0
Missouri	0	0	0	54	38	82	0	0	0	0	1	1
North Dakota	0	0	0	6	15	15	0	0	0	0	0	0
South Dakota	0	0	0	0	17	17	0	0	0	0	0	0
Nebraska	0	0	0	12	52	54	0	1	0	0	0	0
Kansas	2	1	0	40	71	89	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	8	12	9	0	0	0	0	0	0
Maryland [3]	0	1	0	48	34	83	0	0	0	0	0	0
District of Columbia	0	1	0	16	13	24	0	0	0	0	0	0
Virginia	0	0	0	19	43	53	0	0	0	3	1	2
West Virginia	0	0	0	46	24	47	0	0	0	1	0	0
North Carolina	1	1	1	33	34	47	0	0	0	0	2	2
South Carolina	1	0	0	4	8	8	0	0	0	0	1	0
Georgia	1	0	1	13	23	21	0	0	0	0	1	1
Florida	4	0	0	25	9	9	0	0	0	2	2	2
EAST SOUTH CENTRAL												
Kentucky	1	0	1	32	38	62	0	0	0	0	0	1
Tennessee	1	2	0	37	48	73	0	0	0	2	1	2
Alabama	2	2	1	18	17	22	0	0	0	0	0	1
Mississippi [3]	0	0	1	5	16	16	0	1	1	1	1	1
WEST SOUTH CENTRAL												
Arkansas	0	0	0	8	1	13	0	0	1	3	0	1
Louisiana	1	1	0	4	5	6	1	0	0	0	1	2
Oklahoma	1	2	0	8	10	17	0	0	0	1	0	1
Texas	1	1	2	36	45	83	0	0	1	2	3	4
MOUNTAIN												
Montana	0	0	0	20	7	8	0	0	0	0	0	0
Idaho	0	0	0	0	14	14	0	0	0	0	2	0
Wyoming	0	0	0	4	10	10	0	0	0	0	0	0
Colorado	1	0	0	22	48	57	1	0	0	0	1	0
New Mexico	1	0	0	2	5	15	0	0	0	0	0	0
Arizona	0	0	0	9	7	17	0	0	0	0	0	0
Utah [3]	0	1	0	22	15	71	0	0	0	0	0	0
Nevada	0	0	0	0	2	0	0	0	0	0	0	0
PACIFIC												
Washington	1	2	2	47	45	45	0	0	0	0	0	0
Oregon	1	0	0	32	45	40	0	0	0	0	3	1
California	3	13	9	65	135	235	0	1	0	0	2	2
Total	31	43	33	2,536	2,798	4,038	2	4	11	25	38	64
7 weeks	252	449	288	15,513	17,837	26,048	22	27	65	273	292	356
Seasonal low week [4]	(11th) Mar. 15–21			(32d) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	10,463	25,246	13,650	38,052	44,523	64,369	43	81	148	3,682	3,820	4,995

---

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately, as follows: Virginia 2.

Telegraphic morbidity reports from State health officers for the week ended February 21, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended Feb. 21, 1948							
	Week ended—		Median 1943–47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Feb. 21, 1948	Feb. 15, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	5	17	17				1				
New Hampshire		5									
Vermont	51	7	23		1						
Massachusetts	62	179	142		5						3
Rhode Island	12	29	23								
Connecticut	31	40	40								1
MIDDLE ATLANTIC											
New York	137	135	221	10	10		2			1	2
New Jersey	64	87	87	1							
Pennsylvania	106	178	178								
EAST NORTH CENTRAL											
Ohio	107	134	128	1							1
Indiana	42	37	24				1		1		1
Illinois	57	100	96	2	2		4	1			4
Michigan [3]	115	226	97	6	1						1
Wisconsin	102	148	82								4
WEST NORTH CENTRAL											
Minnesota	21	12	22		1						
Iowa	6	17	17								12
Missouri	23	15	14			2					4
North Dakota	14	5	2								
South Dakota	1	1	2								2
Nebraska	3	9	14								1
Kansas	32	13	27							1	
SOUTH ATLANTIC											
Delaware		10	5								
Maryland [3]	20	60	49								2
District of Columbia		8	8								1
Virginia	62	86	38			87					2
West Virginia	16	20	29								
North Carolina	32	42	89					1	3		
South Carolina	99	22	38	1	3		1				
Georgia	8	16	16						1		2
Florida	10	17	19	1						4	3
EAST SOUTH CENTRAL											
Kentucky	16	30	30						1	1	1
Tennessee	56	32	32	1					3		2
Alabama	47	5	9	3					1		
Mississippi [3]	3			5					1	1	
WEST SOUTH CENTRAL											
Arkansas	24	15	15	2		1			1		3
Louisiana	25		7	2					3	2	
Oklahoma	11	4	4	1		1					
Texas	332	332	313	6	143	69			1	9	12
MOUNTAIN											
Montana	15	6	6								
Idaho	8	5	5								1
Wyoming	9	1	1						1		
Colorado	92	7	21								1
New Mexico	15	31	9		1						
Arizona	50	29	16			8					
Utah [3]	53		16								2
Nevada											
PACIFIC											
Washington	14	25	37	2							
Oregon	18	17	17	3							4
California	69	96	97	3	10						1
Total	2,095	2,310	2,310	50	177	168	9	2	17	19	75
Same week: 1947	2,310			65	299	99	5	1	36	34	95
Median, 1943–47	2,310			25	220	73	9	1	9	37	[6] 77
6 weeks: 1948	15,743			403	2,041	1,834	53	5	153	116	646
1947	17,038			327	2,690	1,479	47	2	334	341	634
Median, 1943–47	16,017			192	2,239	873	54	2	155	386	[6] 510

[3] Period ended earlier than Saturday.

[6] 3-year median 1945–47.

Anthrax: Connecticut 1, New York 1, New Jersey 2, Pennsylvania 3.
Leprosy: New York 2, California 1.
Alaska: Chickenpox, 3 cases.
Territory of Hawaii: Leprosy 2, measles 1, scarlet fever 1, whooping cough 24.

WEEKLY REPORTS FROM CITIES *

City reports for week ended February 14, 1948

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	------	0	5	0	5	0	0	12
New Hampshire:												
Concord	0	0	------	0	------	0	1	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	2	0	------	0	239	1	5	0	24	0	0	7
Fall River	0	0	------	0	------	1	1	0	1	0	0	5
Springfield	0	0	------	0	2	0	2	0	2	0	0	------
Worcester	0	0	------	0	1	0	5	0	11	0	0	6
Rhode Island:												
Providence	0	0	------	0	------	0	1	0	6	0	0	4
Connecticut:												
Bridgeport	0	0	------	0	------	0	0	0	7	0	0	2
Hartford	1	0	------	0	2	0	1	0	2	0	0	1
New Haven	0	0	1	0	------	1	1	0	0	0	0	10
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	1	1	1	3	0	10	0	0	7
New York	10	1	8	3	593	5	61	2	73	0	1	21
Rochester	0	0	------	0	1	2	2	0	8	0	0	2
Syracuse	0	0	------	0	8	0	0	0	20	0	0	16
New Jersey:												
Camden	2	0	------	0	1	0	1	0	2	0	0	------
Newark	0	0	1	0	35	0	2	0	8	0	0	5
Trenton	3	0	2	0	2	0	4	0	4	0	0	------
Pennsylvania:												
Philadelphia	1	0	3	0	136	0	19	0	56	0	1	12
Pittsburgh	0	0	1	1	1	1	7	0	16	0	0	7
Reading	0	0	------	0	6	0	0	0	6	0	0	5
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	15	0	13	0	11	0	0	6
Cleveland	0	0	1	0	5	1	11	0	36	0	0	18
Columbus	0	0	------	0	193	0	5	0	9	0	0	12
Indiana:												
Fort Wayne	0	0	1	0	2	0	3	0	3	0	0	------
Indianapolis	0	1	------	0	136	0	4	0	10	0	0	10
South Bend	0	0	------	0	------	0	0	0	3	0	0	2
Terre Haute	1	0	------	0	53	0	1	0	2	0	0	------
Illinois:												
Chicago	1	0	------	0	527	0	30	0	45	0	0	39
Springfield	0	0	------	0	159	0	2	0	0	0	0	2
Michigan:												
Detroit	2	0	------	1	52	2	6	0	56	0	0	38
Flint	0	0	------	0	1	0	2	0	3	0	0	------
Grand Rapids	0	0	------	0	472	0	3	0	4	0	0	2
Wisconsin:												
Kenosha	0	0	------	0	83	0	0	0	0	0	0	------
Milwaukee	0	0	------	0	14	0	2	0	8	0	0	17
Racine	0	0	1	1	88	0	1	0	1	0	0	1
Superior	0	0	------	0	6	0	0	0	3	0	0	------
WEST NORTH CENTRAL												
Minnesota:												
Duluth	1	0	------	0	1	0	2	0	2	0	0	5
Minneapolis	0	0	------	0	183	0	4	0	20	0	0	7
St. Paul	0	0	------	0	16	0	7	0	3	0	0	1
Missouri:												
Kansas City	0	0	4	1	6	0	14	0	3	0	0	20
St. Joseph	0	0	------	0	------	1	0	0	2	0	0	------
St. Louis	0	0	2	0	48	0	13	0	20	0	0	6

*In some instances the figures include nonresident cases.

City reports for week ended February 14, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	11	0	0	0	0	0	0	2
Nebraska:												
Omaha	0	0	------	0	8	0	2	1	0	0	0	------
Kansas:												
Topeka	0	0	------	0	1	0	0	0	1	0	0	------
Wichita	0	0	------	0	1	0	0	0	2	0	0	7
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	29	0	1	0	1	0	0	------
Maryland:												
Baltimore	0	0	3	1	4	1	14	0	3	0	0	11
Cumberland	1	0	------	0	------	0	1	0	1	0	0	------
District of Columbia:												
Washington	0	0	1	1	91	1	10	0	14	0	2	8
Virginia:												
Richmond	0	0	------	1	2	0	0	0	0	0	0	4
Roanoke	0	0	------	0	------	0	0	0	0	0	0	------
West Virginia:												
Charleston	0	0	------	0	------	0	6	0	0	0	0	------
Wheeling	0	0	------	0	6	0	0	0	0	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	0	0	0	0	0	0	------
Wilmington	0	0	------	0	------	0	2	0	0	0	0	6
Winston-Salem	1	0	------	0	------	0	2	0	0	0	0	------
South Carolina:												
Charleston	1	0	69	0	------	0	1	0	0	0	0	1
Georgia:												
Atlanta	0	0	13	0	------	0	8	0	6	0	0	------
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Savannah	0	0	2	0	1	0	1	0	1	0	0	1
Florida:												
Tampa	0	1	1	1	35	1	3	0	0	0	0	4
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	1	56	1	12	0	9	0	0	6
Nashville	0	0	------	0	1	1	4	0	5	0	0	------
Alabama:												
Birmingham	0	0	4	1	------	0	4	0	0	0	0	1
Mobile	0	0	7	2	------	2	3	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	6	0	1	0	1	0	4	0	0	------
Louisiana:												
New Orleans	1	0	5	0	------	2	12	0	0	0	1	4
Shreveport	0	0	------	0	------	0	6	0	1	0	0	------
Oklahoma:												
Oklahoma City	1	0	2	0	------	0	2	0	2	0	0	------
Texas:												
Dallas	0	0	------	0	2	0	0	0	6	0	0	2
Galveston	0	0	------	0	------	0	2	0	0	0	0	------
Houston	1	0	1	0	28	1	4	0	1	0	1	2
San Antonio	0	0	3	4	3	0	12	0	2	0	1	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	------	0	2	0	0	0	0	2
Great Falls	0	0	------	0	2	0	2	0	0	0	0	------
Helena	0	0	------	0	------	0	0	0	0	0	0	------
Missoula	0	0	------	0	------	0	0	0	0	0	0	------
Colorado:												
Denver	0	0	------	0	75	0	3	0	6	0	0	29
Pueblo	1	0	------	0	------	0	1	0	0	0	0	1

City reports for week ended February 14, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	7	1	4	0	12	0	0	4
Spokane	0	0	1	0	2	0	3	0	0	0	0	-----
Tacoma	0	0	------	0	61	0	0	0	5	0	0	3
California:												
Los Angeles	0	0	45	3	28	1	5	0	13	0	0	15
Sacramento	0	0	2	1	1	1	0	0	3	0	0	1
San Francisco	0	0	52	1	122	3	17	0	4	0	0	8
Total	31	3	242	25	3,666	30	394	3	607	0	7	430
Corresponding week, 1947[1]	93	------	93	16	970	------	334	------	701	0	5	683
Average 1943-47[1]	79	------	235	[2] 32	[3] 3.735	------	[2] 445	------	1.324	1	10	626

[1] Exclusive of Oklahoma City.
[2] 3-year average, 1945–47.
[3] 5-year median, 1943–47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (latest available estimated population, 34,389,800)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	7.8	0.0	2.6	0.0	638	7.8	57.5	0.0	152	0.0	0.0	123
Middle Atlantic	7.4	0.5	6.9	2.3	363	4.2	45.8	0.9	94	0.0	0.9	35
East North Central	2.4	0.6	1.8	1.2	1,098	0.6	50.5	0.0	118	0.0	0.0	89
West North Central	2.0	0.0	11.9	2.0	547	2.0	83.6	2.0	105	0.0	0.0	95
South Atlantic	5.0	1.7	148.0	6.6	279	5.0	81.5	0.0	43	0.0	3.3	58
East South Central	0.0	0.0	64.9	23.6	336	23.6	135.7	0.0	83	0.0	0.0	41
West South Central	7.6	0.0	43.2	10.2	86	7.6	99.1	0.0	41	0.0	7.6	20
Mountain	11.1	0.0	0.0	0.0	855	0.0	88.9	0.0	67	0.0	0.0	355
Pacific	0.0	0.0	158.1	7.9	350	9.5	45.9	0.0	59	0.0	0.0	49
Total	4.7	0.5	36.8	3.8	557	4.6	59.9	0.5	92	0.0	1.1	65

Anthrax.—Cases: Trenton 1, Wilmington, Del. 1.
Dysentery, amebic.—Cases: New York 5, Chicago 1, Flint 1, St. Louis 1, Memphis 1, Dallas 1.
Dysentery, bacillary.—Cases: Worcester 4, Providence 3, St. Louis 1.
Dysentery, unspecified.—Cases: San Antonio 3.
Rocky Mountain spotted fever.—Cases: New Orleans 1.
Tularemia.—Cases: Baltimore 1, Atlanta 1, Memphis 1, New Orleans 1.
Typhus fever, endemic.—Cases: Kansas City. 1

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended January 31, 1948.—During the week ended January 31, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox	--------	20	4	202	555	93	68	51	92	1,085
Diphtheria	--------	--------	--------	10	2	2	3	1	--------	18
German measles	--------	--------	--------	10	80	8	1	5	7	111
Influenza	--------	40	--------	--------	9	--------	--------	--------	13	62
Measles	--------	6	3	795	938	8	19	11	53	1,833
Meningitis, meningococcus	1	--------	--------	--------	1	1	1	--------	2	6
Mumps	--------	40	--------	233	438	51	52	29	29	872
Poliomyelitis	--------	--------	--------	--------	--------	2	--------	2	1	5
Scarlet fever	--------	2	11	46	87	3	2	10	15	176
Tuberculosis (all forms)	--------	6	6	160	14	27	10	7	26	256
Typhoid and paratyphoid fever	--------	--------	--------	12	--------	1	--------	--------	--------	13
Undulant fever	--------	--------	--------	--------	2	--------	--------	--------	--------	2
Venereal diseases:										
Gonorrhea	2	8	13	139	90	28	42	63	100	485
Syphilis	2	15	5	78	63	9	11	13	41	237
Whooping cough	--------	3	--------	41	37	15	5	75	23	190

CUBA

Habana—Communicable diseases—4 weeks ended January 31, 1948.—During the 4 weeks ended January 31, 1948, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chickenpox	4	--------	Scarlet fever	3	--------
Diphtheria	21	1	Tuberculosis	7	--------
Malaria	3	--------	Typhoid fever	10	1
Measles	6	1	Typhus fever (murine)	1	1
Poliomyelitis	1	--------			

Provinces—Notifiable diseases—4 weeks ended January 31, 1948.—During the 4 weeks ended January 31, 1948, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana[1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	2	26	12	16	3	21	80
Chickenpox	--------	17	--------	--------	--------	--------	17
Diphtheria	--------	26	--------	1	--------	4	31
Hookworm disease	--------	21	--------	--------	--------	--------	21
Leprosy	--------	5	--------	--------	--------	1	6
Malaria	12	3	--------	4	12	13	44
Measles	--------	7	1	24	2	--------	34
Poliomyelitis	1	2	--------	1	--------	1	5
Scarlet fever	--------	4	--------	--------	--------	--------	4
Tuberculosis	19	12	11	33	9	46	130
Typhoid fever	6	13	2	8	5	11	45
Typhus fever (murine)	--------	1	--------	--------	--------	1	2
Whooping cough	--------	37	--------	--------	--------	--------	37

[1] Includes the city of Habana.

FINLAND

Notifiable diseases—December 1947.—For the month of December 1947, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	17	Poliomyelitis	17
Diphtheria	409	Scarlet fever	226
Dysentery	2	Syphilis	330
Gonorrhea	1,092	Typhoid fever	61
Paratyphoid fever	349		

GUAM

Encephalitis, Japanese "B".—Under date of February 24, 1948, an outbreak of Japanese "B" encephalitis was reported in Guam, with date of onset as December 1, 1947. Up to February 11, 1948, 44 cases had occurred, most of them being among the native population. During the week ended February 6, 1948, 13 cases were reported.

JAMAICA

Notifiable diseases—4 weeks ended January 31, 1948.—During the 4 weeks ended January 31, 1948, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chickenpox	3	20	Poliomyelitis	----------	1
Diphtheria	7	3	Puerperal sepsis	----------	1
Dysentery	1	3	Tuberculosis (pulmonary)	47	52
Erysipelas	1	----------	Typhoid fever	6	95
Leprosy	1	1			

JAPAN

Notifiable diseases—5 weeks ended January 31, 1948.—During the 5 weeks ended January 31, 1948, certain notifiable diseases were reported in Japan as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	2,065	236	Pneumonia	17,451	----------
Dysentery, unspecified	144	41	Scarlet fever	286	2
Gonorrhea	17,699	----------	Smallpox	2	0
Influenza	469	----------	Syphilis	15,332	----------
Malaria	267	0	Tuberculosis	21,350	----------
Measles	3,380	----------	Typhoid fever	553	58
Meningitis, epidemic	160	38	Typhus fever	96	9
Paratyphoid fever	187	8	Whooping cough	3,627	----------

NOTE.—The above figures have been adjusted to include delayed and corrected reports.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Plague

Burma.—For the week ended January 31, 1948, 50 cases of plague with 35 deaths were reported in Burma.

Indochina (French)—Annam State.—For the period January 21–31 1948, 40 cases of plague with 7 deaths were reported in Annam State, French Indochina.

Portugal—Azores Islands—Ponta Delgada.—For the week ended January 17, 1948, 1 suspected case of plague was reported in the port area of Ponta Delgada, Azores Islands, Portugal. The last case previously reported in the Azores was for the week ended September 20, 1947 and occurred in the same locality.

Rhodesia (Northern)—Mankoya District—Barotseland.—For the week ended February 14, 1948, 5 cases of plague with 2 deaths were reported in Barotseland, Mankoya District, Northern Rhodesia. These are the first cases reported in Northern Rhodesia since 1944.

Siam Thailand.—For the week ended January 24, 1948, 18 cases of plague with 4 deaths were reported in Siam.

Smallpox

Siam Thailand.—For the week ended January 24, 1948, 57 cases of smallpox with 3 deaths were reported in Siam, including 30 cases in Bangkok.

DEATHS DURING WEEK ENDED FEBRUARY 14, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Feb. 14, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	10,032	10,007
Median for 3 prior years	10,007	------
Total deaths, first 7 weeks of year	73,296	70,037
Deaths under 1 year of age	670	826
Median for 3 prior years	665	------
Deaths under 1 year of age, first 7 weeks of year	5,040	5,796
Data from industrial insurance companies:		
Policies in force	66,861,796	67,302,666
Number of death claims	10,735	10,354
Death claims per 1,000 policies in force, annual rate	8.4	8.0
Death claims per 1,000 policies, first 7 weeks of year, annual rate	10.0	9.6

X

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE
THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS
G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948

For sale by the Superintendent of Documents, United States Government Printing Office Washington 25, D. C.

Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 MARCH 19, 1948 NUMBER 12

IN THIS ISSUE

Streptomycin in Experimental Q Fever

Studies of Acute Diarrheal Diseases—Epidemiology

Notifiable Diseases, Year 1947

U.S. PUBLIC HEALTH SERVICE

1798

CONTENTS

Page

Action of streptomycin in experimental infection with Q fever. Robert J. Huebner, George A. Hottle, and Eleanor B. Robinson 357

Studies of the acute diarrheal diseases. XVIII. Epidemiology. Albert V. Hardy and James Watt 363

INCIDENCE OF DISEASE

United States:
  Reports from States for week ended February 28, 1948, and comparison with former years 379
  Weekly reports from cities:
    City reports for week ended February 21, 1948 383
    Rates, by geographic divisions, for a group of selected cities 385
  Territories and possessions:
    Hawaii Territory—Plague (rodent) 385
Foreign reports:
  Canada—Provinces—Communicable diseases—Week ended February 7, 1948 386
  New Zealand—Notifiable diseases—5 weeks ended January 3, 1948 386
  Norway—Notifiable diseases—November 1947 386
  Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—
    Plague 387
    Smallpox 387
Deaths during week ended February 21, 1948 387
Notifiable diseases, year 1947 388
Examination for regular corps (Inside back cover)

Public Health Reports

Vol. 63 • MARCH 19, 1948 • *No.* 12

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

ACTION OF STREPTOMYCIN IN EXPERIMENTAL INFECTION WITH Q FEVER[1]

By ROBERT J. HUEBNER, *Sr. Assistant Surgeon,* GEORGE A. HOTTLE, *Sr. Assistant Scientist,* and ELEANOR B. ROBINSON, *Laboratory Technician, United States Public Health Service.*

Reports of recent outbreaks of Q fever in the United States (*1, 2*) as well as in other parts of the world (*3, 4, 5, 6*) have focused attention on the need for a specific therapy. Streptomycin has been found to exercise rickettsiostatic action upon the causative organisms of other rickettsial diseases such as epidemic typhus, endemic typhus, Rocky Mountain spotted fever, and rickettsialpox (*7, 8*). The following is a report of the rickettsiostatic activity of streptomycin in experimental infection with Q fever in embryonated eggs and guinea pigs.

Action of streptomycin on growth of Rickettsia burneti *in the yolk-sac.*—Italian (Henzerling) and American (Dyer) strains of *R. burneti* were used in the experiments. Solutions of crystalline streptomycin (200 mgm/cc.), obtained from the Pure Food and Drug Administration through the courtesy of Dr. Henry Welch, were used throughout. The streptomycin contents of the basic solutions were confirmed by a standard method (*9*). Specified amounts of streptomycin contained in 0.5 cc. of saline were inoculated into the yolk sacs of 7-day-old embryonated eggs less than 10 minutes prior to inoculation of the specified dilutions of infectious suspensions with the exception that control eggs received normal saline instead of streptomycin (table 1). The eggs were candled each morning and all embryos dying within 72 hours of incubation were discarded.

Eggs which in subsequent candling revealed dead or moribund embryos were opened and yolk sac films were stained by Machiavello's technique and examined for rickettsiae. The data in table 1 indicate that both strains of *R. burneti* were suppressed in their growth and that the average life span of the treated embryo was significantly

---

[1] From the Division of Infections Diseases, National Institute of Health, Bethesda, Md.

TABLE 1.—*Effect of streptomycin on growth of Rickettsia burneti in the yolk sac and on the lethal action of R. burneti on the chick embryo*

EXPERIMENT I

Strain of *R. burneti* inoculated [1]	Amount of streptomycin per egg	Number of eggs inoculated	Result in days after inoculation [2]												
			1	2	3	4	5	6	7	8	9	10	11	12	13
Dyer strain	None	5	------	------	------	------	++++ ++++	++++ ++++ ++++	------	------	------	------	------	------	------
	0.5 mg	4	------	------	------	------	------	------	------	------	------	+ + ++ +++	------	------	------
	1.0 mg	5	------	------	------	?(3)	------	------	------	------	------	?	+ +++	++++	------
	2.0 mg	5	------	------	------	------	------	------	------	------	------	------	− −	+ +++ ++++	------
	5.0 mg	5	------	------	------	------	------	------	------	------	------	------	? ? +	? +	------
	10.0 mg	4	------	------	------	------	------	------	------	------	------	------	+ ?(4)	? ?	------

EXPERIMENT II

Strain of *R. burneti* inoculated [1]	Amount of streptomycin per egg	Number of eggs inoculated	1	2	3	4	5	6	7	8	9	10	11	12	13
Henzerling strain	None	6	------	------	------	+ ++ +++	------ ------ ------	++ ++++ ++++	------	------	------	------	------	------	------
	0.5 mg	5	------	------	------	------	------	------	+	+++ ++++ +++	+	------	------	------	------
	1.0 mg	6	------	------	------	------	------	------	−	−	+ +	------	+++ +++	------	------
	5.0 mg	6	------	------	------	------	------	− −	------	------	------	------	(3)− − − −	------	------

EXPERIMENT III

Henzerling strain	None	5							+ +++ +++ +++ ++++						
	10.0 mg	9									— —			— — ?[4]	[3]— — — ?[4]

[1] Dilution of infected yolk sac in saline used as inoculum=1/100.

[2] Dead and moribund embryos opened each morning.

[3] Some treated embryos alive and apparently normal when egg opened.

[4] Yolk sac from these eggs subinoculated—producing rich growth of visible rickettsiae in each instance.

NOTE: — = no rickettsiae seen.
? = presence of rickettsiae questionable.
+ = less than 10 visible rickettsiae.
++ = 10 to 100 rickettsiae per field.
+++ = 150 to 1,000 rickettsiae per field.
++++ = innumerable rickettsiae per field.

TABLE 2.—*Streptomycin levels of guinea-pig serums*

Guinea pig No.	Dose of streptomycin prior to bleeding mgm.	Elapse of time before bleeding (minutes)	Streptomycin level γ per ml.
1	7.5	60	40.0
2	7.5	60	40.0
3	5.0	150	5.0
4	5.0	150	2.5
5 (ill)	None		[1] 0.15
6 (ill)	None		0.30
7 (normal)	None		<0.075
8 (normal)	None		<0.075

---

[1] No explanation is offered for the slight inhibition of growth of *B. circulans* by the serums of the ill but untreated guinea pigs.

prolonged. Larger doses of streptomycin appeared to produce higher degrees of rickettsiostatic action than smaller doses. The action of streptomycin even in the largest dose (10 mg/egg) was manifestly not rickettsiocidal since treated yolk sacs, apparently free of visible rickettsiae, on subculture in embryonated eggs yielded a uniformly heavy growth of rickettsiae.

Effect of streptomycin in experimental infection in guinea pigs.—The following experiments were designed to determine the effect of treatment with streptomycin on the lethal action of *R. burneti* in guinea pigs.

Highly lethal yolk sac suspensions of the Dyer strain of *R. burneti* were used to infect the guinea pigs. Preliminary titrations of the infecting suspensions inoculated intraperitoneally indicated that a 1–100 (or 1–1,000) dilution would produce death of all inoculated guinea pigs in 6 to 8 days. A 1–10,000 dilution was found to be only slightly less virulent. A stock suspension diluted at 1–10 in skim milk was preserved at −50° C. and was used in each experiment. Both the 1–100 and 1–10,000 dilutions produced high fever (40.5° C. to 41.5° C.), inactivity, and anorexia within 24 to 48 hours. Most of the untreated guinea pigs which died within 8 days after inoculation with the infectious suspension were found on autopsy to have ruptured spleens. In order to counteract such overwhelming doses of *R. burneti,* treatment with streptomycin was begun 3–4 hours after injecting the infecting suspensions. The total daily dosage of streptomycin for each guinea pig in each of the experiments was 30 mgm. contained in 6 cc. of saline. Three to six inoculations were made daily, 8 to 4 hours apart, respectively. Based upon the weight of the guinea pigs (600–700 gm.), the dosage varied approximately from 40 to 50 mgm/kg. of body weight. The streptomycin was given subcutaneously.

Four treated guinea pigs in experiment IV (table 3) were bled during treatment and their serums tested for streptomycin content. The concentration of streptomycin in guinea pig serum was determined by a standard method (*9*). In this method dilutions of serum which inhibited the growth of *Bacillus circulans* in broth were compared with similar dilutions of a standardized streptomycin solution. The results were expressed in terms of micrograms of the purified streptomycin (table 2).

Table 3 gives the results of two guinea-pig experiments in which the effect of streptomycin on the lethal action of *R. burneti* is shown. Despite the small numbers of animals used, the differences between the control groups (1 survivor of 28 inoculated) and the streptomycin-treated groups (19 survivors of 24 inoculated) could not have been expected to occur by chance.

TABLE 3.—*Effect of streptomycin*[1] *in suppressing lethal action of* R. burneti (*Dyer strain*) *for guinea pigs*

EXPERIMENT IV

R. burneti in yolk sac suspension; inoculated intraperitoneally	Treatment with streptomycin			Weight		Deaths in days after injection														Survivors / Number inoculated
	Number of doses daily	Total amount received daily	Number of guinea pigs	Mean	Range	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1 cc. of 1–100 dilution of yolk sac	None	None	10	613	574–627	----	6	2	2	----	----	----	----	----	----	----	----	----	----	0/10
	3–6	30 mgm	10	614	577–602	----	----	----	----	----	----	----	----	----	----	----	----	1	----	9/10
1 cc. of 1–10000 dilution of yolk sac	None	None	10	701	631–773	----	2	----	5	1	----	1	----	----	----	----	----	----	----	1/10
	3–6	30 mgm	10	702	642–752	----	----	----	[2] 1	1	----	----	----	----	1	----	----	----	----	7/10

EXPERIMENT V

R. burneti in yolk sac suspension; inoculated intraperitoneally	Number of doses daily	Total amount received daily	Number of guinea pigs	Mean	Range	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Survivors / Number inoculated
1 cc. of 1–100 dilution of yolk sac	None	None	4	--------	----------	----	1	2	1	----	----	----	----	----	----	----	----	----	----	0/4
	None[3]	None	4	--------	----------	----	2	----	1	----	1	----	----	----	----	----	----	----	----	0/4
	3 (2 cc. each)	30 mgm	4	--------	----------	----	----	1	----	----	----	----	----	----	----	----	----	----	----	3/4

[1] Treatment begun on same day that guinea pigs were infected. In experiment IV: First 5 days, 6 doses; next 5 days, 4 doses; last 6 days, 3 doses. In experiment V: Treatment continued for 12 days.

[2] Embryos aborted; followed by death of guinea pig several hours later.

[3] Doses of normal saline, 2 cc. each.

The effect of treatment with streptomycin on the febrile manifestations of Q fever was less clearly shown. Treated guinea pigs had only a slightly longer incubation period (average 2.2 days) before onset of fever than the controls (average 1.4). In general the treated pigs carried a fever as long as the controls—however, the control pigs died early, many of them showing a subnormal temperature on the day of death.

SUMMARY

Crystalline streptomycin, in doses as low as 0.5 miligram, was found to exercise a rickettsiostatic action on the growth of *R. burneti* in the yolk sacs of fertile eggs. Although there was no evidence of rickettsiocidal action with doses as high as 10 mg. per egg, inhibition of growth was greater with the higher doses. Guinea pigs inoculated with highly virulent yolk sac suspensions of *R. burneti* showed a low mortality rate when treated with 30 mg. of streptomycin given three to six times daily by the subcutaneous route.

The amounts of streptomycin per kilogram of body weight which were used in the guinea pig experiments were comparable to dosages recommended for treatment of streptomycin-susceptible diseases in man. Treatment of the guinea pigs was initiated at a much earlier stage than could be achieved in human infection with Q fever. However, the infectious doses administered to the guinea pigs were overwhelmingly large and the primary objective of the experiments was to observe the action of streptomycin in preventing death of guinea pigs infected with Q fever.

REFERENCES

(*1*) Topping, Norman H., Shepard, Charles C., and Irons, J. V.: Q fever in the United States. J. A. M. A. **133:** 813 (March 1947).

(*2*) Shepard, Charles C.: An outbreak of Q fever in a Chicago packing house. Am. J. Hyg. **46:** 185 (Sept. 1947).

(*3*) Gsell, O.: Pneumonies a *Rickettsia burneti.* Med. et Hyg. **108:** 317 (Oct. 1947).

(*4*) Robbins, F. C. and Ragan, C. A.: Q fever in the Mediterranean area: Report of its occurrence in Allied troops. Am. J. Hyg. **44:** 6 (July 1946).

(*5*) Commission on Acute Respiratory Diseases. Identification and characteristics of the Balkan grippe strain of *Rickettsia burneti.* Am. J. Hyg. **44:** 110 (July 1946).

(*6*) Cheney, G. and Geib, W. A.: The identification of Q fever in Panama. Am. J. Hyg. **44:** 158 (July 1946).

(*7*) Smadel, Joseph E.; Jackson, Elizabeth G.; and Gould, Ross L.: Factors influencing the growth of rickettsiae I. Rickettsiostatic effect of streptomycin in experimental infections. J. Immunol. **57:** 273 (Nov. 1947).

(*8*) Morgan, H. R.; Stevens, D. A.; and Snyder, J. C.: Effect of streptomycin on growth of rickettsiae in eggs. Proc. Soc. Exper. Biol. & Med. **64:** 342 (March 1947).

(*9*) Price, C. W.; Nielsen, P. K.; and Welch, H.: The estimation of streptomycin in body fluids. Science. **103:** 56 (Jan. 1946).

STUDIES OF THE ACUTE DIARRHEAL DISEASES

XVIII. Epidemiology [1] [2]

By ALBERT V. HARDY,[3] and JAMES WATT, *Surgeon, United States Public Health Service*

In preceding papers the general plan of study was stated, the bacteriological findings given, and the clinical data described. The accumulated epidemiological observations are presented here. These data are largely a record of the findings in a total of 825 households in New Mexico, Georgia, and New York. Supplementary observations on institutional inmates and military personnel are included.

STUDY AREAS

Four study areas were selected to represent those with very high, high, medium, and low reported mortality from the diarrheal diseases.

TABLE 1.—*Reported mortality from the diarrheal diseases in the United States and in the four areas in which studies were conducted* [1]

Year	Mortality per 100,000 population per annum														
	United States			Puerto Rico			New Mexico			Georgia			New York State		
	Dysentery	Diarrhea and enteritis	Total	Dysentery	Diarrhea and enteritis	Total	Dysentery	Diarrhea and enteritis	Total	Dysentery	Diarrhea and enteritis	Total	Dysentery	Diarrhea and enteritis	Total
1941	1.8	10.5	12.3	11.5	417.1	428.6	19.7	50.4	70.1	3.4	17.7	21.1	0.5	4.2	4.7
1940	1.9	10.3	12.2	5.2	405.1	410.3	14.1	45.3	59.4	3.9	17.3	21.2	.2	4.3	4.5
1939	1.9	11.6	13.5	6.8	396.0	402.8	11.3	44.7	56.0	4.3	17.6	21.9	.3	5.7	6.0
1938	2.3	14.3	16.6	11.2	314.4	425.6	14.2	49.8	64.0	6.4	27.5	33.9	.4	6.1	6.5
1937	2.3	14.7	17.0	13.5	473.6	487.1	11.1	81.2	92.3	4.2	20.6	24.8	.4	7.1	7.5
1936	2.4	16.4	18.8	10.7	469.1	479.8	14.7	71.2	85.9	5.1	24.7	29.8	.4	7.1	7.5
1935	1.9	14.1	16.0	6.7	359.5	366.2	5.7	77.7	83.4	5.3	22.8	28.1	.4	7.5	7.9

[1] Data from Vital Statistics, Special Reports (State Summaries). U. S. Bureau of the Census.

There is a wide variation in mortality rates in the United States as a whole and in the States and Territory in which the study areas were situated (table 1). The reported mortality from dysentery, diarrhea and enteritis in Puerto Rico was much higher than in any other Territory or State. The high rates for New Mexico were similar to the rates for Arizona. Georgia was selected as representative of the Southern States with from 10 to 50 reported deaths from diarrheal diseases per 100,000 population per annum. Elsewhere in the United

---

[1] From the Division of Infectious Diseases, National Institute of Health, with the cooperation of State, insular, and local health departments of the areas in which the studies were conducted, the Indian Medical Service, and the DeLamar Institute of Public Health, Columbia University.

[2] See end of article for other papers in this series.

[3] From the Bureau of Laboratories, Florida State Board of Health.

States the mortality from these causes was in line with that in New York State, the Pacific States having the most favorable record.

Investigations were begun in New Mexico in 1936 and were continued there through 1938. The area selected for study was centrally located Bernalillo County and surrounding Indian communities. The population of the county was 45,430 in 1930 and 69,391 in 1940, an increase of 52.7 percent. The city of Albuquerque and its suburbs included more than half the residents. The remainder lived on irrigated farms in the river valley, in villages scattered in the hills, and in widely separated ranch homes. Racial groups were not separately enumerated in the Federal census, but the State Department of Education found that the pupils in the elementary schools in Bernalillo County were divided about equally between English-speaking and Spanish-speaking families.

Dougherty County, Georgia, selected as a representative southern county, was studied during 1939 and 1940. It is in the southwestern section of the State, with a population in 1940 of 28,565. More than half were residents of the city of Albany. The remainder lived on farms or in the few small villages. More than half (54 percent) were Negroes.

The observations in New York were obtained in Manhattan, New York City, during 1939 and 1940. The rarity of the diarrheal diseases made it practicable to obtain observations from this population group which numbered 1,889,924 in 1940 and included 15.8 percent Negroes.

The epidemiological data from Puerto Rico, studied during 1941 and 1942, were not adequate for statistical analysis and will be used for general comparative purposes only. The study area included a small town and a rural municipality.

The inmates of 10 institutions for the mentally defective or the mentally ill (8 in New York, 1 in Illinois, and 1 in Puerto Rico) were studied. Some observations were obtained, also, from military units in Puerto Rico.

INCIDENCE

Mortality data provide at most a crude measure of the relative incidence of diarrheal diseases. The wide variations by locality are evident in table 1. The importance of *Shigellae* as a cause of death from diarrheal disease is suggested in table 2. Of the 51 deaths among New Mexico and Georgia cases under 2 years of age, 39 individuals or 75 percent, had stool cultures positive for *Shigellae*. There was only 1 death among patients over 2 years of age.

The age distribution of cases reported by physicians or discovered through epidemiological inquiries and the annual morbidity rates per

TABLE 2.—Shigella *infection in patients dying of diarrheal diseases in study areas in New Mexico (1937–38) and Georgia (1939–1940) by age groups*

Age in months	Number of deaths in series	Culture-positive for *Shigellae*		Culture-negative for *Shigellae*	
		Number	Percent	Number	Percent
0–5	17	9	52.9	8	47.1
6–11	21	19	90.1	2	9.9
12–23	13	11	84.6	2	15.4
24 and over	1	0	----------	1	----------
Total	52	39	75.0	13	25.0

1,000 population are given in table 3. Reported or discovered diarrheal disease known to be due to *Shigellae* varied from 3.6 per 1,000 population per annum in New Mexico in 1938 to 0.04 in New York City. The culture-negative cases varied similarly in incidence. These figures for shigellosis are conservative estimates since all examinations could not be made under optimum conditions. For example, if all cases had been examined with multiple cultures during the acute phase of the illness, a part, at least, of the negative group would have had positive cultures.

TABLE 3.—*Annual morbidity rates for acute diarrheal diseases in New Mexico’ Georgia, and New York based on cases reported by physicians and found by epidemiological investigation*

Age in years	Number of cases								Cases per 1,000 population per annum							
	Positive[1]				Negative[2]				Positive[1]				Negative[2]			
	Mew Mexico		Georgia,[3] 1939–40	New York City, 1938	New Mexico		Georgia,[3] 1939–40	New York City, 1938	New Mexico		Georgia,[3] 1939–40	New York City, 1938	New Mexico		Georgia,[3] 1938–40	New York City, 1938
	1937	1938			1937	1938			1937	1938			1937	1938		
Under 1	35	52	10	7	31	92	27	134	21.0	30.1	11.4	0.3	18.6	53.2	31.0	6.4
1	25	40	27	9	16	52	13	32	16.3	25.0	30.7	.4	10.4	32.5	14.9	1.5
2	15	34	7	12	9	22	11	13	9.5	20.8	7.3	.5	5.7	13.5	11.9	.5
3	6	17	4	8	2	10	4	8	3.7	10.2	4.1	.3	1.2	6.0	4.1	.3
4	3	11	2	10	3	7	5	4	1.9	6.6	2.1	.4	1.9	4.2	5.2	.2
5–9	7	13	5	22	6	17	4	16	.9	1.5	.9	.2	.7	2.0	.7	.1
10–14	5	9	0	3	8	7	9	10	.7	1.3	0	(4)	1.2	1.0	1.8	.1
15–19	4	7	5	0	3	7	7	1	.6	1.1	1.0	0	.5	1.1	1.4	(4)
20–24	7	10	4	3	6	17	7	0	1.2	1.7	.9	(4)	1.1	2.9	1.7	0
25–34	11	24	3	2	9	22	15	1	1.2	2.6	.5	(4)	1.0	2.4	2.5	(4)
35–44	0	7	5	1	6	25	15	1	0	.9	1.0	(4)	.8	3.2	3.0	(4)
45–54	5	5	1	0	4	14	4	0	1.0	.9	.3	0	.8	2.6	1.1	0
55–64	1	5	0	1	1	3	0	1	.3	1.4	0	(4)	.3	.9	0	(4)
65 and over	2	2	2	1	1	5	2	0	.8	.8	1.2	(4)	.4	1.9	1.2	0
Unknown	0	1	0	3	1	8	1	4	-----	-----	-----	-----	-----	-----	-----	-----
Total	126	237	75	82	106	308	124	227	2.0	3.6	1.7	.04	1.7	4.7	2.9	.13

[1] *Shigellae* isolated by fecal culture.
[2] *Shigellae* not isolated by fecal culture.
[3] Cases observed in 18 months.
[4] Less than 0.05.

The following factors must be considered in the further evaluation of these data: (1) The discovered rates were higher in New Mexico in 1938 than in 1937, the 2 years our study was in progress. We believe this reflects only a more complete reporting of cases in 1938 since during the second year the number of reported deaths from diarrheal diseases dropped substantially in the county and State, and the practicing physicians recognized a distinct decline in morbidity; (2) The completeness of reporting in Georgia probably compares favorably with that in New Mexico in 1938, since the study area was smaller and the laboratory was open throughout the year thus permitting a more intensive study; (3) In both of these States (New Mexico, and Georgia), it was apparent that the reporting was incomplete especially during the months of high incidence, since additional individuals who were or had been ill recently with acute diarrhea were readily discovered by case-finding procedures; (4) In New York City, by contrast, cases were hard to find; physicians in practice and those attending child hygiene clinics commonly commented that endemic acute diarrhea was rarely encountered. The higher proportion of mild cases reported in New York suggests reasonably complete recording. Incomplete reporting usually reveals a preponderance of severe illnesses.

Indians were excluded from table 3 since satisfactory population data were not available. Most of the cases among Indians were reported from hospitals which served reservations in New Mexico and Arizona. During the 2 years, 93 positive and 78 negative cases were observed. While comparative rates for Indians cannot be presented, it was apparent that the incidence of infectious diarrheal disease in this population group was high.

A satisfactory measure of morbidity from diarrheal diseases could not be obtained in Puerto Rico since the usual case-reporting procedures were not sufficiently developed. Post-mortem fecal cultures obtained by rectal swabs from infants reported to have died of diarrhea did reveal an annual mortality of approximately one death from *Shigella* infection per 1,000 population per annum. This is approximately 10 times the mortality rate from all diarrheal diseases on the continent. A comparable difference in morbidity rates would be expected.

The bacteriological results of culture surveys of general population groups were reported in XIII of this series. The individuals were questioned about current and preceding (within 3 months) attacks of diarrhea. The number of cases found and the annual morbidity rates for the selected population groups are shown in table 4. A very high morbidity from diarrheal disorders is shown. Comparison of these rates with those given in table 3 emphasizes the fact that only a small portion of the cases of shigellosis and other diarrheal disorders are seen by physicians. In general, we believe that the high rates approximate the true morbidity from these diseases, while the reported cases are a partial measure of the more severe illnesses of this nature. Some confirmation of this belief was obtained in our studies of institutional groups. For each case which normally would be considered as bacillary dysentery by the local authorities, a careful study would reveal a number of individuals with proved infection whose only symptoms were mild diarrhea or slight fever.

TABLE 4.—*Annual morbidity rates of acute diarrheal diseases in New Mexico and Georgia based on cases found by intensive follow-up studies of selected general population groups* [1]

Age in years	Person-years observation			Cases discovered						Cases per 1,000 person-years					
				Culture-positive			Culture-negative			Culture-positive			Culture-negative		
	New Mexico	Georgia	Total	New Mexico	Georgia	Total	New Mexico	Georgia	Total	New Mexico	Georgia	Total	New Mexico	Georgia	Total
Under 1	66	32	98	13	3	16	20	24	44	197	94	163	303	750	449
1	14	28	42	8	4	12	8	21	29	571	143	286	571	750	690
2	23	28	51	7	2	9	6	15	21	304	71	176	261	536	412
3	23	32	55	7	1	8	7	10	17	304	31	145	304	313	309
4	24	21	45	2	0	2	3	6	9	83	0	44	125	250	200
5–9	102	152	254	17	1	18	14	14	28	167	7	71	137	92	110
10–14	56	107	163	7	3	10	5	16	21	125	28	61	89	150	129
15–19	31	57	88	2	1	3	6	4	10	65	18	34	193	70	114
20–24	39	66	105	7	5	12	2	12	14	179	76	114	51	182	133
25–34	70	125	195	3	5	8	5	30	35	43	40	41	71	240	179
35–44	40	110	150	4	4	8	7	24	31	100	36	53	175	218	207
45 and over	39	158	197	7	4	11	4	34	38	179	25	56	103	215	193
Total	527	916	1,443	84	33	117	87	210	297	159	36	81	165	229	206

[1] History of diarrheal disease obtained at time of culture and all positive households revisited for additional questioning. In New Mexico new families were seen each month, in Georgia the same families were revisited on a monthly basis.

An exact measure of the ratio of shigellosis to nonspecific diarrheas was not obtained since general population surveys were made without regard to previous history of illness. The following facts indicate that the ratio shown is a minimal figure. Fifty-three of the individuals cultured were ill on the day they were examined. A *Shigella* type was isolated from 34 (64 percent) of these individuals. In contrast, 361 well persons with a history of diarrhea within 3 months were cultured. Only 83 (23 percent) of these patients had a positive culture. It is obvious that more frequent cultures would have increased the number of illnesses found to be associated with specific infection with a member of the *Shigella* group.

The prevalence of subclinical (asymptomatic) infections was also determined by these survey cultures and is discussed in detail in XIII of this series. The rates varied widely by region. The discovered prevalence of 4 percent for the New Mexico and Georgia areas indicates a very high annual incidence of infection since the average duration of an untreated *Shigella* infection is approximately 6 weeks. By contrast, in New York City carriers of *Shigella* were rarely identified. Of 1,659 individuals tested in 1939 and 1940, only two carriers were found. More recently, all persons admitted to a mental hospital serving this urban population were examined culturally. No carrier of *Shigella* was found in 2,497 individuals tested during a period of 20 months. In an urban area of this character, the annual incidence rate of shigellosis must be quite low.

Extensive surveys of institutional population groups were conducted also. Here too, the prevalence of *Shigella* infection varied widely. When clinical infections were occurring at the rate of 2 or more per week, the total prevalence usually was from 5 to 30 percent in the particular group. The rate was usually below 5 percent when clinical cases were less frequent as well as in the period shortly after the apparent termination of an outbreak. In five groups, during the 3 to 6 months after an outbreak about 1 percent were found infected. In a few of these groups repeated examinations over a year or more failed to reveal any pathogenic *Shigella.*

There was a similar wide range in the number of subclinical infections found in military units in Puerto Rico. With a large number of clinical cases, the rates of *Shigella* infection were high; with few or no clinical cases, the rates were low.

AGE DISTRIBUTION OF DEATHS AND CASES

There were significant variations in the age distribution of proved cases of shigellosis and other diarrheal disorders as observed in the main study areas (tables 2, 3, 4, and 5).

TABLE 5.—*The prevalence of passive carriers of* shigellae *in New Mexico and Georgia as determined by fecal cultures on healthy individuals in the general population* [1]

Age	Number of fecal cultures			Number positive for *shigellae*			Percent positive for *shigellae*		
	New Mexico	Georgia	Total	New Mexico	Georgia	Total	New Mexico	Georgia	Total
Under 1	214	94	308	1	1	2	0.5	1.0	0.7
1	37	82	119	2	4	6	5.4	4.9	5.0
2	72	93	165	3	3	6	4.2	3.2	3.5
3	73	112	185	10	1	11	13.7	.9	5.9
4	85	74	159	6	5	11	7.1	6.8	6.9
5–9	370	586	956	40	22	62	10.8	3.9	6.5
10–14	207	407	614	15	7	22	7.3	1.7	3.6
15–19	111	222	333	7	4	11	6.3	1.8	3.3
20–24	145	240	385	17	5	22	11.7	2.1	5.7
25–34	265	447	712	17	1	18	6.4	.2	2.5
35–44	146	406	552	12	6	18	8.2	1.5	3.3
45–54	67	333	400	5	5	10	7.5	1.5	2.5
55–64	37	115	152	1	0	1	2.7	0	.7
65 and over	36	130	166	11	2	6	11.1	1.5	3.6
Total	1,865	3,341	5,206	140	66	206	7.5	2.0	4.0

[1] All individuals stated that they had had no diarrheal disorder for at least 1 year before the examination.

Deaths from all diarrheal disorders were concentrated in the first years of life. During the studies of general population groups, 39 deaths from shigellosis were observed (table 2); there were also 13 diarrheal-disease deaths involving individuals whose stool cultures were negative. The majority of the deaths apparently due to shigellosis occurred in the infants 6 to 18 months old. By contrast, 8 of the 13 deaths in the negative group were infants less than 6 months old.

The nonfatal but relatively severe diarrheal diseases revealed by case reporting were also most common in young children (table 3). The highest rate of proved shigellosis in reported cases in New Mexico was in infants under 1 year; in Georgia the rate was highest in children 1 to 2 years old. The rates then declined progressively up to 4 years of age. The morbidity rates by age for New York City children were low and did not show significant age variation. The age distribution of the disorders that were culture-negative differed chiefly in the relatively higher incidence in infants under 1 year.

The case rates by age for the disorders are revealed (table 4) by surveys of the general population. A much larger proportion of these cases were milder than those reported by physicians (table 3). This type of case finding revealed a much higher attack rate in all age groups for both culture-positive and culture-negative cases. Young children continued to show the highest rates.

The notable features of the age distribution of the subclinical infections (table 5) are the very low rates for infants, the uniform and high rates at ages 1 to 9 years, and the slight decline in the rates for older children and adults.

Two observations on institutional inmates were particularly impressive: (1) Dysentery was a recurrent problem in groups of young children; (2) the clinical attack rate was strikingly high in patients newly admitted to any group in which the infection was persistent endemically.

Thus, when infants under 1 year were infected with *Shigellae*, almost all had clinical symptoms; the cases tended to be severe, and before specific chemotherapy was available many terminated fatally. The total prevalence was the highest in the second year of life, but here fatal infections were less frequent, and clinically mild disorders and subclinical infections were more common. With increasing age there was a decline in the severity of the disease and an increase in the relative proportion of subclinical infections. The latter, however, remained at a high and relatively constant level from ages 1 through 9 years. Shigellosis in persons above this age was usually a subclinical infection. The discovered clinical cases tended to be mild; severe bacillary dysentery, as commonly described, was rarely encountered. In New Mexico, where *Shigella* infections were prevalent, the largest number of reported cases with a positive culture were in infants under

1 year. In Georgia, where the infection was less frequent, the peak of reported cases was in the second year of life. In New York City where the incidence was very low, cases were scattered with little variation in incidence among children up to 10 years of age.

SEX INCIDENCE

There was an approximately equal sex distribution of positive cases up to 14 years of age, but there was a significant excess in the male cases under 1 year of age in the culture-negative series (table 6). At ages 15 to 44, there was a preponderance of females in both groups. (The informants usually were women.) There were 117 cases within this age group in New Mexico and Georgia in families with cases culturally positive for *Shigellae;* 80 (68 percent) were females. Of the corresponding 112 cases in families in which all cases were culture-negative for *Shigellae,* 69 (62 percent) were females. The excess was most marked at ages 20 to 34 years. The observations in New York did not provide significant variations.

TABLE 6.—*Reported and discovered cases of acute diarrhea, by age and sex, in families with cases culture positive for* Shigella, *and in those with culture negative cases only*

Age	Number of household histories obtained						Household attack rates (percent)			
	Ill with diarrhea				Healthy contacts		Excluding index cases		Including index cases	
	Index cases		Contact cases							
	M	F	M	F	M	F	M	F	M	F
	Households containing 1 or more cases culture-positive for *Shigella*									
NEW MEXICO AND GEORGIA										
Under 1	36	34	7	13	5	8	58	62	90	85
1–4	70	67	29	32	50	37	37	46	66	73
5–14	15	6	16	21	88	109	15	16	26	20
15–44	12	30	25	50	219	230	10	18	14	26
45 and over	5	6	10	8	45	30	18	21	25	32
Unknown	2	0	2	3	5	4	------	------	------	------
All ages	140	143	89	127	412	418	18	23	36	39
NEW YORK CITY										
All ages	18	25	11	20	71	66	13	23	29	41
	Households containing only cases culture-negative for *Shigella*									
NEW MEXICO AND GEORGIA										
Under 1	74	42	2	1	5	14	29	7	90	76
1–4	52	51	15	19	45	54	25	26	60	57
5–14	11	11	13	9	128	134	9	6	16	13
15–44	18	42	25	27	303	329	8	8	12	17
45 and over	10	8	2	4	43	29	4	12	23	29
Unknown	0	0	1	5	7	17	------	------	------	------
All ages	165	154	58	65	531	577	10	10	30	27
NEW YORK CITY										
All ages	62	66	10	14	196	223	5	6	27	26

HOUSEHOLD ATTACK RATES

The attack rates for acute diarrhea in affected households (excluding and including the index cases) are given by age and sex in table 6. In "positive families,"—those with a proved case of clinical shigellosis—the secondary attack rates were highest in the young, and in New Mexico and Georgia the rate declined from a total of 61 percent in the first year of life to 16 percent at ages 5 to 14 years. The rates were at about this level in older age groups. The corresponding figures for the negative families were consistently lower.

Only a small number of the infants in families with acute diarrhea remained free of this disorder and the rates were high for children from 1 to 4 years. Secondary and total household attack rates were closely similar in all areas, even though the prevalence of diarrheal diseases in the general population varied widely.

TABLE 7.—*Secondary attack rates, by race and area, in families with cases of acute diarrhea, according to culture findings in the households*

Race and area	"Positive households" [1]				"Negative households" [2]			
	Index cases	Contacts			Index cases	Contacts		
		Total	Ill			Total	Ill	
			Number	Percent			Number	Percent
NEW MEXICO								
Anglo-American	101	324	105	32	127	418	56	13
Spanish-American	110	447	66	15	109	435	22	5
Indian	21	93	18	19	14	78	3	4
Total	232	864	189	22	250	931	81	9
GEORGIA								
White	25	73	16	22	37	162	30	19
Negro	26	109	11	10	32	138	12	9
Total	51	182	27	15	69	300	42	14
NEW YORK								
White	29	106	18	17	92	314	18	6
Negro	14	62	13	21	36	129	6	5
Total	43	168	31	18	128	443	24	5

[1] Households in which one case or more of acuate diarrhea was found positive for *Shigella*.
[2] Households in which all cases of acute diarrhea were culture-negative for *Shigella*.

Differences by race and area (table 7) show that the secondary attack rates for the Anglo-Americans and the whites were higher than those for the Spanish-Americans and Negroes in the respective areas. Mortality data indicate, however, that diarrheal diseases are more serious among Spanish-American and Negroes than among the Anglo-Americans. An exact uniformity of reports from these different racial groups could not be assured. Language difference made it more difficult to obtain histories from the Spanish-speaking and

Indian families than from the Anglo-Americans in New Mexico. Also, where diarrhea was of common occurrence, little attention was paid to the milder disorders, which probably were often unknown to the informant or forgotten by the patient. Where these disorders were rare, the mild attacks, since they were unusual, would be recalled and reported. These factors were recognized in the beginning and every effort was made to minimize their influence. We do not believe that they played an important role in Georgia (where such artificial variations should be small) since the whites had a secondary attack rate more than twice that of the Negroes.

There were 216 secondary cases in the positive households in New Mexico and Georgia; 175 were examined culturally and 114 (65.2 percent) were positive (table 8). Often these were examined during convalescence or after recovery, and the percentage of individuals with proved infections is strong evidence that a very high proportion of these secondary illnesses were due to *Shigella.*

TABLE 8.—*Results of single fecal cultures for* Shigella *on secondary cases and contacts found by epidemiological investigation of households having a culture positive* Shigella *case of acute diarrhea*

Age	Contacts with history of diarrhea			Contacts without history of diarrhea		
	Number cultured	*Shigella* isolated		Number cultured	*Shigella* isolated	
		Number	Percent		Number	Percent
Under 1	19	13	68	6	0	0
1–4	54	43	80	27	6	22
5–14	30	18	60	59	12	20
15–44	53	31	53	107	19	18
45 and over	17	8	47			
Unknown	2	1	50			
Total	175	114	65	199	37	19

The findings on a single culture examination of each of 199 healthy contacts of known positive cases are given in table 8. Nineteen percent of the health contacts were found to be passive carriers.

There were 1,329 persons in the 283 positive families in New Mexico and Georgia. The proved positive individuals included 261 index cases, 114 contact cases, and 37 passive carriers—a total of 412 (31 percent). The unexamined contacts included 41 who became ill and 631 who did not. Assuming that there would have been the same proportion of positive observations among these had they been examined, there would be an additional 27 positive cases and 117 passive carriers. Adding these to the proved infected individuals there would be 261 positive index cases, 141 positive contact cases, and 154 passive carriers, in all 556 (41.8 percent) infected of the 1,329 family members. The observed and computed prevalence rates given above were based largely on single cultural tests. If these had been repeated and continued through a period adequate to indicate incidence rates, it seems certain that the majority of the household contacts of shigellosis would have been found infected.

SEASONAL DISTRIBUTION

Our data on seasonal distribution are incomplete because of the interrupted operation of our laboratory and transfers from one study area to another. Available information on clinical cases is given in table 9. The seasonal variation in incidence was marked in New Mexico and Georgia, but was less marked in New York. The summer rise was earlier in Georgia than in New Mexico. The seasonal distribution of the culturally positive and negative cases was similar.

TABLE 9.—*The observed seasonal distribution of acute diarrheal disease, by area and cultural findings*

	Number and percentage of cases by month of onset											
	New Mexico				Georgia				New York			
	Positive		Negative		Positive		Negative		Positive		Negative	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
January	8	3.4	10	4.2	0	0	3	5.3	6	7.5	8	3.8
February	[1]2	.8	[1]0	0	0	0	3	5.3	[1]1	1.3	[1]0	0
March	[1]2	.8	[1]0	0	1	2.7	3	5.3	[1]0	0	[1]0	0
April	[1]2	.8	[1]0	0	1	2.7	4	7.0	[1]1	1.3	[1]1	.5
May	[1]2	.8	[1]1	.4	14	36.8	14	24.5	6	7.5	2	1.0
June	20	8.5	22	9.2	10	26.3	18	31.6	10	12.5	24	11.5
July	95	40.3	92	38.6	9	23.4	6	10.5	6	7.5	25	12.0
August	55	23.3	48	20.2	1	2.7	2	3.5	8	10.0	66	31.5
September	24	10.3	29	12.2	1	2.7	2	3.5	19	23.7	26	12.4
October	18	7.6	18	7.6	1	2.7	2	3.5	8	10.0	34	16.3
November	6	2.6	15	6.3	0	0	0	0	9	11.2	13	6.2
December	2	.8	3	1.3	0	0	0	0	6	7.5	10	4.8
Total	236	100.0	238	100.0	38	100.0	57	100.0	80	100.0	209	100.0

[1] Incomplete data.

MANIFEST SOURCES OF CONTACT

A manifest source is defined here as any clinical case or cases occurring currently or in the preceding month with which the individual might have had direct or indirect contact. Such sources included preceding cases in the household and in the immediate neighborhood, or those known to have been encountered elsewhere. A majority of the positive index cases (80 percent in New York, 72 percent in Georgia and 56 percent in New Mexico) occurred as isolated infections unrelated to any manifest source insofar as could be determined by inquiry.

The following observation and comment reported in XIII of this series warrants repetition. "Of the 380 culture-positive persons encountered in these surveys of general population groups only 2 were under the care of a physician. One case acutely ill when found on the survey was admitted to the hospital the following day and died 2 days later. Without a special study, only these 2 would have been tested culturally, and thus there would have been 2 demonstrated and 378 undetected infectious with *Shigellae*. Thus, for every known infection (manifest source) there are numerous unrecognized infections (hidden source). In the light of these findings it is not surprising that endemic diarrheal diseases commonly appear to be scattered sporadic cases. These seemingly unrelated infections may arise from a single source or be joined by a series of undetected infections. This knowledge is essential for the interpretation of the epidemiology of the acute diarrheal diseases."

POSSIBLE MODES OF SPREAD

All of our household studies included descriptions of water supply, excreta disposal, food including milk, housing, fly prevalence, and general hygiene. In addition special sanitary surveys were made in the various areas. These data have been analyzed and compared, and a summary of the findings is presented below.

Water.—Water supplies varied from well managed presumably safe public supplies to open surface wells and irrigation ditches. The wells often were hazardously close to unsanitary privies and had defective superstructures. The water supply to certain of the Indian pueblos was provided from satisfactory Government-built deep wells. Cases occurred with equal frequency in groups, otherwise comparable, using public water systems and in those using unsafe well water. Good wells in the Indian pueblos did not result in a low rate of diarrheal disorders. Shigellosis spread readily among inmates of institutions having a sanitary water supply. Institutional outbreaks were ordinarily limited in distribution with heavily infected groups and uninfected groups using water from a common source. We found no evidence that contaminated water was responsible for the outbreaks observed in military units.

Excreta disposal.—*Shigella* infections were slightly more common in homes having a privy than in those with a flush toilet. The significance of the change from defective to satisfactory outhouses was studied in one community. The incidence of diarrheal diseases was less in the 2 years after the installation of sanitary privies as compared with the preceding year. In these later years, though the infection was introduced to the community, there was no evidence of any wide dissemination such as was observed repeatedly in other semirural unsanitated neighborhoods. All institutional and military groups involved in an outbreak of shigellosis were supplied with flush toilets or sanitary privies.

Food.—No evidence was found to indicate that milk supplies were important in the spread of the observed cases. In New Mexico canned milk was used more commonly in families with infection than in the general population. This was the usual source of milk for the Indians among whom the diarrheal diseases were very prevalent. In Georgia, raw and canned milk was used with equal frequency by the positive and negative households and cases; in New York City canned and pasteurized milk exclusively was purchased in the households studied. The milk served in institutions and military units was pasteurized, canned, or dried.

It was commonly found the patient blamed one or another seasonal fruit or vegetable for an attack of diarrhea. Our data indicate that, in general, consumption of these foodstuffs was coincidental rather than causative in the case of the proved *Shigella* infections as well as in the negative endemic diarrheal disorders. We did not obtain any information about the possible role of various meats in the spread of endemic salmonellosis.

Twenty-six outbreaks of shigellosis were investigated in these studies. Only one of these epidemics, reported in IV of this series, was traced to an infected food supply. Some supplementary spread by way of food handlers was noted in two other epidemics. In these, infected food played only a minor role in the transmission of the infection. This was in spite of the fact that food handlers were as commonly found infected as other groups in the general population.

Flies.—The cases, and particularly the positive ones in New Mexico, occurred most commonly where flies were prevalent. On the other hand, they occurred in New York in the absence of flies. A high prevalence and active spread of shigellosis was observed in institutional and military groups when there were no flies.

Laboratory tests on the fly did not provide any strong indication of its danger. Only one isolation of *Shigella* was made in 112 attempts with pooled specimens of flies. A majority of the flies were caught in the dysentery ward of the mental hospital in Puerto Rico. These flies had easy access to heavily positive excreta, since a shortage of attendants made adequate sanitation an impossibility. Flies were swatted in the ward, immediately transferred to nutrient broth and then subcultured on SS agar. Under these circumstances, the failure to isolate *Shigellae* was impressive.

General and personal cleanliness.—Diarrheal disorders were particularly common in homes rated as defective in general cleanliness. The institutional inmates usually involved in *Shigella* outbreaks were those with the poorest habits of personal cleanliness. In military units more than 10,000 survey cultures were taken by rectal swabs. On taking these we recorded all instances in which there was gross fecal contamination in the anal region. The prevalence of *Shigella* infection was more than 15 percent in three of the units; here over two-thirds of the men had visible fecal material in the anal region. The prevalence of infection was 5 percent in another camp; here one-third had evidence of fecal soiling as above. The prevalence of shigellosis was less than 2 percent in the other groups studied; less than 10 percent and usually less than 5 percent of the men examined showed gross fecal contamination.

The possible role of contaminated fingers in the spread of *Shigella* infections was examined by laboratory methods. A wide-mouthed specimen bottle with nutrient lactose broth and a fermentation tube were used. The tips of the fingers of each hand were dipped and rinsed in the culture medium. Immediately thereafter material from under the nails was scraped into the broth by a sterile nail file. After 6 and 18 hours incubation S. S. agar was streaked. Eosin methylene-blue agar was also inoculated at 18 hours. A total of 268 finger and fecal cultures were obtained concurrently, and *Shigellae* were isolated by fecal culture from 39 and by finger cultures from 4 (10 percent) of those with positive stool findings. Fecal cultures were negative in 229, but *Shigellae* were isolated by finger cultures from 2 of this group (1 percent). Tests for *Escherichia coli* were completed in 235 of the finger cultures and were positive in 192 (82 percent). The individuals tested were inmates of a mental hospital. They did not include either the excited or untidy patients. They had ready access to the wash room and showers and used them freely.

Economic status and crowding.—Diarrheal diseases were much more common in the poor families than in the well-to-do and were similarly associated with overcrowding.

Sanitary surveys of the general population in New Mexico showed that 20 percent of the homes had two or more persons per room. This degree of overcrowding was found in 49 percent of the families with cases of diarrhea positive for *Shigellae.* In Georgia overcrowding of this type was found in 51 percent of the positive households and in 30 percent of those with negative cases only. The element of overcrowding was also present in military and institutional groups studied.

The evidence obtained relative to possible modes of spread of *Shigella infection* and other diarrheal diseases may be summarized as follows.

No evidence was found of dissemination of these diseases through water or milk. Other foodstuffs were rarely indicted in the endemic disorders and even less frequently convicted. Epidemics, particularly of salmonellosis, were found which were food-borne. The exact importance of this mode of spread could not be assessed with certainty; the striking feature however was the lack of substantial incriminating evidence.

The presence of flies, improper excreta disposal, bad personal hygiene, overcrowding, and bad habits of personal hygiene were all associated with an excess of diarrheal disorders. The relative importance of these factors could not be determined from our data. It is certain that *Shigella* infections spread easily in crowded groups in the absence of flies. The evidence obtained in institutional and military groups indicated that bad personal hygiene in these groups was most important. Further study is needed however to determine the specific role of insects in the spread of these infections.

SUMMARY

1. The epidemiology of the acute diarrheal diseases was studied in New Mexico, Georgia, New York, and Puerto Rico.
2. The recent reported mortality from diarrheal diseases in these areas varied from more than 400 to less than 5 deaths per 100,000 population per annum.
3. Seventy-five percent of the children who died from diarrheal diseases in New Mexico and Georgia were found, by the culture method, to be positive for *Shigella.*
4. The discovered morbidity from these infections varied according to the method used in collecting data. The rates were comparatively low when reported cases were considered but were high when intensive case-finding procedures were used. The morbidity from culture-negative diarrheal disorders varied similarly.
5. Subclinical shigellosis was identified frequently.
6. *Shigella* infections in infants and young children were often serious or fatal diseases; older children had milder clinical attacks and many subclinical infections; adolescents and adults most commonly had subclinical attacks.
7. The total attack rates, including clinical and subclinical infections, were relatively constant from ages 1 to 9 years and at a higher level than those for infants, adolescents, and adults.
8. There were only minor variations in incidence by sex.
9. Household attack rates were high, and varied inversely with the general incidence of diarrheal disease in the population group.
10. The incidence of these diseases was high in summer and low in winter.
11. Cases of acute diarrhea due to *Shigella* in the general population occurred chiefly as isolated infections, unrelated to other manifest sources.
12. There was strikingly little evidence that these enteric infections were disseminated by water, milk, or other food. Finger contamination and relatively direct person-to-person spread appeared to be chiefly

responsible for the dissemination of these infections in institutional and military groups. Flies, combined with defective excreta disposal, were potential means of spread, but our data did not provide an exact measure of their importance.

REFERENCES

Other papers in the series, Studies of the Acute Diarrheal Diseases, are:

I. Hardy, A. V., Watt, J., DeCapito, T. M., and Kolodny, M. H.: Differential culture media. Pub. Health Rep. **54:** 287 (1939).

II. Spector, B. K., Hardy, A. V., and Mack, M. G.: Parasitological observations. Pub. Health Rep. **54:** 1105 (1939).

III. Hardy, A. V.; Watt, J.; Kolodny, M. H., and DeCapito, T. M.: Infections due to the "Newcastle dysentery bacillus." Am. J. Pub. Health. **30:** 53 (1940).

IV. Hardy, A. V., Frant, S., Jarcho, S. W., and Schlosser, E. G.: An outbreak of bacillary dysentery due to the "Newcastle dysentery bacillus." Pub. Health Rep. **55:** 2101 (1940).

V. Mosher, W. E., Jr., Wheeler, S. M., Chant, H. L., and Hardy, A. V.: An outbreak due to *Salmonella typhi murium.* Pub. Health Rep. **56:** 2415 (1941).

VI. Hardy, A. V., Watt, J., and DeCapito, T. M.: New procedures in bacteriological diagnosis. Pub. Health Rep. **57:** 521 (1942).

VII. Watt, J., Hardy, A. V., and DeCapito, T. M.: Carriers of *Shigella dysenteriae.* Pub. Health Rep. **57:** 524 (1942).

VIII. Hardy, A. V., Watt, J., Peterson, James, Peterson, Jerome, and Schlosser, E.: Sulfaguanidine in the control of *Shigella dysenteriae* infections. Pub. Health Rep. **57:** 529 (1942).

IXA. Hardy, A. V., Shapiro, R. L., Chant, H. L., and Siegel, M.: *Shigella dysenteriae* infections among institutional inmates. Pub. Health Rep. **57:** 1079 (1942). IXB. Watt, J., Hardy, A. V., and DeCapito, T. M.: *Shigella dysenteriae* infections among institutional inmates. Pub. Health Rep. **57:** 1095 (1942).

XA. Hardy, A. V., Burns, W., and DeCapito, T. M.: Cultural observations on the relative efficacy of sulfonamides in *Shigella dysenteriae* infections. Pub. Health Rep. **58:** 689 (1943).

XB. Hardy, A. V., and Cummins, S. D.: A preliminary note on the clinical response to sulfadiazine therapy. Pub. Health Rep. **58:** 693 (1943).

XC. Hardy, A. V.: Further cultural observations on the relative efficacy of sulfonamides in *Shigella* infections. Pub. Health Rep. **60:** 1037 (1945).

XD. Watt, J., and Cummins, S. D.: Further studies on the relative efficacy of sulfonamides in shigellosis. Pub. Health Rep. **60:** 1355 (1945).

XI. Hardy, A. V., Watt, J., and DeCapito, T. M.: The typing of *Shigella dysenteriae* Flexner. Pub. Health Rep. **58:** 696 (1943).

XII. Hardy, A. V., and Watt, J.: Etiology. Pub. Health Rep. **60:** 57 (1945).

XIII. Watt, J., and Hardy, A. V.: Cultural surveys of normal population groups. Pub. Health Rep. **60:** 261 (1945).

XIV. Hardy, A. V., and Watt, J.: Clinical observations. Pub. Health Rep. **60:** 521 (1945).

XV. Watt, J., and DeCapito, T. M.: The agglutination test in *Shigella paradysenteriae* infections. Pub. Health Rep. **60:** 642 (1945).

XVI. Watt, J., and Carlton, E.: An outbreak of *Salmonella typhimurium* infection among newborn premature infants. Pub. Health Rep. **60:** 734 (1945).

XVII. Hardy, A. V.: The sulfonamides in shigellosis. Pub. Health Rep. **61:** 857 (1946).

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED FEBRUARY 28, 1948

Summary

A total of 9,008 cases of influenza was reported, as compared with 11,234 last week and a 5-year (1943–47) median of 5,192. Of the 13 States reporting currently more than 80 cases (all in the South Atlantic, South Central, Mountain, and Pacific areas), only 5 showed increases—Virginia 556 to 768, West Virginia 82 to 178, Oklahoma 84 to 357, Utah 80 to 151, and Oregon 635 to 798. Of the current total, 9 States, all in the above-mentioned areas, reported an aggregate of 7,884 cases (88 percent). Of the 92,191 cases reported for the year to date, 7 States have reported 79,062 cases (86 percent), as follows: Virginia 7,212, South Carolina 8,629, Alabama 4,512, Arkansas 4,155, Texas 36,537, Arizona 8,524, California 9,493. The total number of cases reported during the 30-week period since the average date of seasonal low incidence is 135,749, as compared with 65,592 for the same period last year, which was the lowest number for a corresponding period of the past 5 years, and 642,347, the highest, in 1943–44, and a 5-year median of 65,830.

The total of 20 cases of poliomyelitis reported (no State reporting more than 3 cases) is less than reported for any corresponding week since 1943 (15 cases).

Indiana, Nebraska, and Kansas each reported 1 case of smallpox. The cumulative figure for smallpox for the year to date is 25, as compared with 30 for the same period last year and a 5-year median of 77. New Jersey and Pennsylvania each reported 1 case of anthrax, and California 1 case of leprosy.

Deaths recorded during the week in 93 large cities of the United States totaled 9,765, as compared with 10,655 last week, 10,165 and 10,390, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 10,165. The total for the 9 weeks ended February 28 is 93,716, as compared with 89,943 for the corresponding period last year. Infant deaths during the week in the same cities totaled 600, as compared with 776 last week, 796 for the same week last year, and a 3-year median of 689. The cumulative figure is 6,416, as compared with 7,377 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended Feb. 28, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	Feb. 28, 1948	Feb. 22, 1947		Feb. 28, 1948	Feb. 22, 1947		Feb. 28, 1948	Feb. 22, 1947		Feb. 28, 1948	Feb. 22, 1947	
NEW ENGLAND												
Maine	1	1	0	4	1	1	21	301	15	0	0	1
New Hampshire	0	0	0	-------	1	-------	-------	7	7	0	0	0
Vermont	2	0	0	-------	-------	-------	-------	248	195	1	0	0
Massachusetts	10	13	3	-------	-------	-------	502	461	453	3	3	5
Rhode Island	0	2	0	1	1	1	4	211	34	0	0	1
Connecticut	0	0	0	2	-------	1	29	382	360	0	0	2
MIDDLE ATLANTIC												
New York	5	20	19	[1] 13	[1] 7	[1] 7	1,480	243	1,469	3	7	27
New Jersey	3	5	2	2	3	10	1,137	287	689	0	3	6
Pennsylvania	4	15	13	(2)	(2)	[2] 6	961	513	1,614	11	8	25
EAST NORTH CENTRAL												
Ohio	7	13	11	2	5	10	1,204	641	239	3	2	6
Indiana	18	10	7	11	8	10	1,072	41	298	0	0	4
Illinois	2	5	10	2	1	8	2,438	56	553	5	4	15
Michigan [3]	4	5	5	-------	2	5	1,544	72	285	0	4	12
Wisconsin	1	0	2	80	20	49	557	196	386	1	1	2
WEST NORTH CENTRAL												
Minnesota	7	8	5	-------	-------	1	242	114	42	3	4	1
Iowa	1	1	2	16	-------	-------	784	22	33	5	3	3
Missouri	4	1	6	11	10	5	202	4	360	3	1	7
North Dakota	1	3	1	6	21	20	49	4	4	1	0	1
South Dakota	0	0	2	-------	-------	-------	32	11	85	0	0	1
Nebraska	0	0	3	16	1	10	42	7	48	0	0	1
Kansas	3	7	5	60	61	8	13	9	320	1	2	2
SOUTH ATLANTIC												
Delaware	0	2	1	-------	-------	-------	29	1	9	1	0	1
Maryland [3]	4	8	6	4	6	6	53	38	48	2	2	8
District of Columbia	1	1	1	-------	-------	1	194	11	41	0	0	2
Virginia	3	4	6	768	534	743	139	267	349	3	2	12
West Virginia	8	1	2	178	52	39	407	89	58	2	1	3
North Carolina	9	8	8	-------	-------	-------	6	209	209	3	2	7
South Carolina	4	0	4	943	225	800	64	33	44	3	1	2
Georgia	4	3	5	46	39	106	23	96	96	0	1	3
Florida	4	6	2	20	18	4	107	11	41	1	0	9
EAST SOUTH CENTRAL												
Kentucky	11	12	7	5	8	10	189	2	142	1	0	8
Tennessee	6	5	4	126	20	68	145	54	186	7	2	8
Alabama	6	11	11	424	102	212	69	40	60	7	2	6
Mississippi [3]	3	4	4	58	-------	-------	65	-------	-------	2	0	6
WEST SOUTH CENTRAL												
Arkansas	5	4	5	376	126	217	154	79	79	0	1	4
Louisiana	1	10	7	56	21	21	20	7	97	0	4	4
Oklahoma	6	5	5	357	59	129	75	1	57	3	0	1
Texas	15	29	34	3,147	2,465	2,142	1,119	152	518	3	8	16
MOUNTAIN												
Montana	2	2	2	11	11	11	151	279	129	0	0	1
Idaho	2	1	1	23	8	-------	45	7	30	0	0	0
Wyoming	0	0	0	-------	12	9	67	16	35	0	1	0
Colorado	6	3	6	55	1,117	61	191	51	132	0	0	3
New Mexico	3	2	2	9	2	2	8	48	28	0	0	1
Arizona	1	3	3	519	120	147	23	55	39	0	0	2
Utah [3]	1	0	0	151	16	45	15	2	48	0	0	0
Nevada	0	0	0	-------	-------	-------	5	-------	-------	0	0	0
PACIFIC												
Washington	2	5	4	156	13	1	334	18	150	1	2	4
Oregon	0	10	2	798	2	20	25	23	94	1	0	1
California	31	29	29	552	74	91	1,022	148	677	5	8	25
Total	211	277	277	9,008	5,192	5,192	17,057	5,567	15,725	85	79	290
8 weeks	1,813	2,443	2,480	92,191	32,617	36,354	92,173	35,437	69,199	686	667	1,987
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	8,171	100,09	11,037	135,749	65,592	65,830	127,119	58,324	95,323	1,468	1,639	4,149

[1] New York City only.
[2] Philadelphia only.
[3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended Feb. 28, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47
	Feb. 28, 1948	Feb. 22, 1947		Feb. 28, 1948	Feb. 22, 1947		Feb. 28, 1948	Feb. 22, 1947		Feb. 28, 1948[5]	Feb. 22, 1947	
NEW ENGLAND												
Maine	0	0	0	47	20	23	0	0	0	0	0	0
New Hampshire	0	0	0	2	1	10	0	0	0	0	0	0
Vermont	0	0	0	2	10	13	0	0	0	0	0	0
Massachusetts	0	0	0	107	152	271	0	0	0	0	2	1
Rhode Island	0	0	0	10	13	13	0	0	0	0	0	0
Connecticut	0	0	0	31	60	79	0	0	0	0	1	1
MIDDLE ATLANTIC												
New York	3	1	1	291	359	486	0	0	0	4	0	3
New Jersey	0	0	1	85	156	134	0	0	0	1	2	2
Pennsylvania	1	0	0	311	200	319	0	0	0	2	2	3
EAST NORTH CENTRAL												
Ohio	0	0	0	463	406	396	0	0	0	2	0	3
Indiana	0	0	0	96	136	136	1	0	1	1	2	2
Illinois	0	2	0	137	134	261	0	0	1	2	2	1
Michigan [3]	0	3	1	174	197	197	0	0	0	1	1	1
Wisconsin	0	0	0	60	94	229	0	0	0	0	1	0
WEST NORTH CENTRAL												
Minnesota	2	2	0	39	50	68	0	0	0	1	0	0
Iowa	0	0	0	54	39	72	0	0	0	0	0	0
Missouri	0	0	0	27	40	87	0	0	0	0	0	1
North Dakota	0	3	0	4	14	14	0	0	0	0	0	0
South Dakota	0	0	0	7	22	18	0	0	0	0	2	0
Nebraska	0	0	0	21	40	47	1	0	0	0	0	0
Kansas	0	1	0	46	54	99	1	0	0	0	2	1
SOUTH ATLANTIC												
Delaware	0	0	0	2	11	7	0	0	0	0	0	0
Maryland [3]	0	0	0	32	24	102	0	0	0	0	1	0
District of Columbia	0	0	0	11	11	35	0	0	0	1	0	0
Virginia	0	4	1	21	45	61	0	0	0	3	3	2
West Virginia	1	0	0	33	10	41	0	0	0	2	0	1
North Carolina	3	1	0	15	22	39	0	0	0	1	0	0
South Carolina	0	1	0	1	11	7	0	0	0	1	0	1
Georgia	0	0	0	17	23	23	0	0	0	1	2	2
Florida	2	2	2	14	16	16	0	0	0	0	3	0
EAST SOUTH CENTRAL												
Kentucky	0	0	0	32	42	45	0	1	0	0	5	0
Tennessee	1	1	0	37	27	85	0	0	0	0	1	2
Alabama	3	1	1	11	20	18	0	1	0	0	1	1
Mississippi [3]	0	1	1	5	9	11	0	0	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas	0	2	0	8	5	9	0	0	1	1	0	0
Louisiana	0	0	0	2	2	12	0	0	0	2	3	2
Oklahoma	0	2	2	11	10	28	0	0	0	0	0	0
Texas	0	1	1	10	38	78	0	1	1	1	1	5
MOUNTAIN												
Montana	2	0	0	25	6	22	0	0	0	0	1	0
Idaho	0	0	0	10	15	15	0	0	0	1	0	0
Wyoming	0	0	0	8	6	7	0	0	0	0	0	0
Colorado	0	0	0	26	53	63	0	0	0	1	0	0
New Mexico	0	0	0	10	10	10	0	0	0	0	0	0
Arizona	0	0	0	9	7	12	0	0	0	0	0	0
Utah [3]	0	1	1	33	11	51	0	0	0	0	0	0
Nevada	0	0	0	0	2	2	0	0	0	0	0	0
PACIFIC												
Washington	0	0	0	114	42	62	0	0	0	2	0	0
Oregon	0	0	0	27	47	47	0	0	0	1	3	1
California	2	9	5	108	146	218	0	0	0	1	0	2
Total	20	38	26	2,646	2,868	4,367	3	3	12	33	41	47
8 weeks	[6] 271	487	314	18,159	20,705	30,415	25	30	77	306	333	409
Seasonal low week [4]	(11th) Mar. 15-21			(32nd) Aug. 9-15			(35th) Aug. 30-Sept. 5			(11th) Mar. 15-21		
Total since low	[6] 10,482	25,284	13,690	40,698	47,391	68,736	46	84	160	3,715	3,861	5,054

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately, as follows: New York 1, Pennsylvania 1 (salmonella infection), Virginia 1, North Carolina 1, Washington 2 (salmonella infection).

[6] Correction (deducted from cumulative totals): Poliomyelitis, Indiana week ended Feb. 7, 1 case (instead of 2).

Telegraphic morbidity reports from State health officers for the week ended Feb. 28, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended Feb. 28, 1948							
	Week ended—		Median 1943–47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Feb. 28, 1948	Feb. 22, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	23	18	23	------	------	------	------	------	------	------	------
New Hampshire	3	------	1	------	------	------	------	------	------	------	------
Vermont	43	15	15	------	------	------	------	------	------	------	------
Massachusetts	48	154	138	------	------	------	1	------	------	------	1
Rhode Island	------	10	18	------	------	------	------	------	------	------	------
Connecticut	27	40	48	------	------	------	------	------	------	------	1
MIDDLE ATLANTIC											
New York	141	155	171	8	3	------	------	------	------	------	4
New Jersey	73	186	115	1	------	------	------	------	------	------	1
Pennsylvania	124	238	204	------	------	------	------	------	------	------	1
EAST NORTH CENTRAL											
Ohio	121	126	126	------	------	------	------	------	1	------	1
Indiana	45	68	26	------	------	------	------	------	------	------	1
Illinois	53	66	66	3	------	------	6	------	1	------	7
Michigan [3]	101	236	132	6	1	------	------	------	------	------	------
Wisconsin	75	180	103	------	------	------	------	------	------	------	3
WEST NORTH CENTRAL											
Minnesota	19	10	19	------	------	------	------	------	------	------	3
Iowa	2	48	14	------	------	------	1	------	------	------	1
Missouri	17	31	16	------	------	------	------	------	4	------	------
North Dakota	29	------	------	------	------	------	------	------	------	------	------
South Dakota	5	1	1	------	------	------	------	------	------	------	2
Nebraska	3	22	14	------	------	------	------	------	------	------	1
Kansas	46	15	21	------	------	------	------	------	------	------	2
SOUTH ATLANTIC											
Delaware	------	5	5	------	------	------	------	------	------	------	------
Maryland [3]	18	92	40	------	------	------	------	------	------	------	1
District of Columbia	10	9	6	1	------	------	------	------	------	------	------
Virginia	40	111	55	------	------	79	------	------	------	1	1
West Virginia	57	10	39	------	5	------	------	------	------	------	------
North Carolina	30	32	83	------	5	------	------	------	------	------	------
South Carolina	92	14	40	------	3	------	------	------	2	------	------
Georgia	8	12	12	------	------	------	------	------	1	------	2
Florida	20	24	[3] 23	3	------	------	------	------	------	3	2
EAST SOUTH CENTRAL											
Kentucky	16	20	34	------	------	------	------	------	------	------	------
Tennessee	45	20	23	5	------	2	------	------	3	------	3
Alabama	77	31	31	1	------	------	3	------	------	------	------
Mississippi [3]	2	------	------	2	1	------	------	------	4	1	1
WEST SOUTH CENTRAL											
Arkansas	27	16	16	8	------	------	------	------	3	------	------
Louisiana	7	------	1	------	------	------	------	------	2	1	------
Oklahoma	61	24	15	------	------	------	------	------	------	------	------
Texas	328	410	279	14	163	18	1	------	------	2	4
MOUNTAIN											
Montana	6	1	11	------	------	------	------	------	------	------	------
Idaho	5	10	------	------	------	------	------	------	------	------	------
Wyoming	3	12	2	------	------	------	------	------	------	------	------
Colorado	112	44	30	------	------	------	------	------	------	------	7
New Mexico	41	34	9	------	------	------	------	------	------	------	------
Arizona	60	14	15	------	------	10	------	------	------	------	------
Utah [3]	19	4	12	------	------	------	------	------	------	------	2
Nevada	2	------	------	------	------	------	------	------	------	------	------
PACIFIC											
Washington	58	33	24	------	------	------	------	------	------	------	1
Oregon	25	12	15	------	------	------	------	------	------	------	1
California	84	118	118	5	13	------	------	------	------	------	1
Total	2,251	2,731	2,406	57	194	109	12	0	21	8	55
Same week: 1947	2,731	------	------	33	293	146	5	2	32	44	114
Median, 1943–47	2,406	------	------	33	293	82	8	1	16	44	[7] 71
8 weeks: 1948	17,994	------	------	460	2,235	1,943	65	5	174	124	701
1947	19,769	------	------	360	2,983	1,625	52	4	366	385	748
Median, 1943–47	18,423	------	------	222	2,428	955	61	3	175	436	[7] 675

[3] Period ended earlier than Saturday.

[7] 3-year median 1945–47.

Actinomycosis: South Dakota 2. *Anthrax:* New Jersey 1, Pennsylvania 1. *Leprosy:* California 1.
Territory of Hawaii: Amebic dysentery 1, scarlet fever 1, whooping cough 16.

WEEKLY REPORTS FROM CITIES*

City reports for week ended February 21, 1948

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	------	0	4	0	28	0	0	7
New Hampshire:												
Concord	0	0	------	0	------	0	0	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	6	0	------	0	425	0	19	0	40	0	0	9
Fall River	0	0	------	0	------	0	2	0	2	0	0	4
Springfield	2	0	------	0	2	0	0	0	1	0	0	1
Worcester	0	0	------	0	------	0	9	0	11	0	0	3
Rhode Island:												
Providence	0	0	------	0	------	0	5	0	4	0	0	10
Connecticut:												
Bridgeport	1	0	------	0	------	0	0	0	5	0	0	------
Hartford	0	0	------	0	3	0	1	0	2	0	0	2
New Haven	0	0	------	0	2	0	0	0	2	0	0	2
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	3	0	5	0	3	0	0	8
New York	9	2	11	1	1,101	6	81	1	91	0	1	21
Rochester	0	0	------	0	1	0	2	0	10	0	0	------
Syracuse	3	0	------	0	17	0	0	0	5	0	0	14
New Jersey:												
Camden	0	0	------	0	1	0	2	0	3	0	0	1
Newark	0	0	2	0	37	0	4	0	8	0	0	4
Trenton	0	0	1	0	1	0	3	0	2	0	0	------
Pennsylvania:												
Philadelphia	1	0	1	1	201	0	19	0	60	0	2	19
Pittsburgh	0	1	1	2	1	1	17	0	16	0	0	5
Reading	0	0	------	0	11	0	1	0	6	0	0	4
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	23	0	4	0	12	0	0	6
Cleveland	1	0	1	0	1	0	6	0	31	0	0	20
Columbus	0	0	------	0	193	0	5	0	5	0	0	4
Indiana:												
Fort Wayne	0	0	------	0	2	0	2	0	11	0	0	------
Indianapolis	4	0	4	2	189	1	1	0	7	0	0	7
South Bend	0	0	------	0	------	0	0	0	2	0	0	------
Terre Haute	0	0	------	0	34	0	1	0	0	0	0	------
Illinois:												
Chicago	0	3	------	0	840	1	32	0	55	0	0	22
Springfield	0	0	------	0	211	0	2	0	1	0	0	2
Michigan:												
Detroit	2	0	1	0	74	0	19	0	59	0	1	22
Flint	0	0	------	0	0	0	2	0	2	0	0	------
Grand Rapids	0	0	------	0	428	0	0	0	2	0	0	7
Wisconsin:												
Kenosha	0	0	------	0	91	0	0	0	0	0	0	4
Milwaukee	0	0	------	0	70	0	2	0	13	0	0	13
Racine	0	0	------	0	123	0	0	0	1	0	0	------
Superior	1	0	------	0	22	0	0	0	3	0	0	5
WEST NORTH CENTRAL												
Minnesota:												
Duluth	1	0	------	0	6	0	0	0	1	0	0	1
Minneapolis	0	0	------	0	207	1	13	0	12	0	0	10
St. Paul	0	0	------	1	15	0	7	0	2	0	0	7
Missouri:												
Kansas City	0	0	9	1	3	0	7	0	3	0	0	11
St. Joseph	0	0	------	0	------	0	0	0	2	0	0	1
St. Louis	4	0	1	1	106	1	7	0	18	0	0	6

*In some instances the figures include nonresident cases

City reports for week ended February 21, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	2	0	0	0	1	0	0	6
Nebraska:												
Omaha	0	0	------	0	8	0	4	0	5	0	0	1
Kansas:												
Topeka	0	0	------	0	------	0	0	0	1	0	0	3
Wichita	0	0	------	0	------	0	2	0	2	0	0	5
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	19	0	1	0	3	0	0	------
Maryland:												
Baltimore	1	0	1	0	13	0	13	0	17	0	0	6
Cumberland	4	0	------	0	------	0	1	0	5	0	0	------
Frederick	0	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	96	0	7	0	16	0	0	------
Virginia:												
Lynchburg	0	0	------	0	2	0	2	0	1	0	0	7
Roanoke	0	0	------	0	------	0	0	0	2	0	0	------
West Virginia:												
Charleston	0	0	------	0	8	0	6	0	0	0	0	------
Wheeling	0	0	------	0	1	0	2	0	1	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	0	1	0	0	0	0	------
Wilmington	4	0	------	0	------	0	0	0	1	0	0	3
Winston-Salem	0	0	------	0	------	0	3	0	5	0	0	------
South Carolina:												
Charleston	0	0	17	0	------	0	3	0	0	0	0	2
Georgia:												
Atlanta	0	0	13	1	1	0	6	0	10	0	0	------
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Savannah	0	0	------	0	------	0	2	0	1	0	0	1
Florida:												
Tampa	0	0	3	2	30	0	2	0	1	0	0	2
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	1	1	75	0	10	0	4	0	0	2
Nashville	0	0	------	1	------	1	1	0	4	0	0	2
Alabama:												
Birmingham	0	0	12	0	3	0	10	0	3	0	0	2
Mobile	1	0	69	0	2	4	3	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	18	0	2	0	3	0	4	0	0	1
Louisiana:												
Shreveport	0	0	------	0	------	0	5	0	0	0	0	------
Oklahoma:												
Oklahoma City	0	0	4	0	3	0	3	0	5	0	0	------
Texas:												
Dallas	0	0	1	1	18	0	3	0	1	0	0	4
Galveston	0	0	------	0	------	0	1	0	0	0	0	1
Houston	0	0	1	2	33	0	4	0	2	0	0	1
San Antonio	0	0	------	0	------	0	9	0	0	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	1	0	0	0	0	0	0	------
Great Falls	0	0	------	0	2	0	2	0	2	0	0	------
Helena	0	0	------	0	------	0	0	0	1	0	0	------
Missoula	0	0	------	0	7	0	0	0	1	0	0	------
Idaho:												
Boise	0	0	------	0	------	0	2	0	0	0	0	------
Colorado:												
Denver	1	0	7	0	112	0	2	0	4	0	0	27
Pueblo	0	0	------	0	------	0	0	0	1	0	0	1
Utah:												
Salt Lake City	0	0	------	0	25	0	1	1	5	0	0	3

City reports for week ended February 21, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	9	1	7	0	20	0	0	13
Spokane	0	0	1	0	1	0	0	0	1	0	0	------
Tacoma	0	0	------	0	86	0	0	0	6	0	0	1
California:												
Los Angeles	1	0	39	0	-------	0	4	1	15	0	1	18
Sacramento	1	0	---	0	-------	0	0	0	3	0	1	2
San Francisco	1	0	43	4	156	3	16	0	6	0	0	5
Total	50	6	262	21	5,159	20	425	3	701	0	6	381
Corresponding week, 1947 [1]	77	------	93	16	1,166	----	371	------	763	0	4	664
Average 1943-47 [1]	73	-----	190	[2] 30	[3] 4,184	-----	[2] 437	------	1,386	1	10	631

[1] Exclusive of Oklahoma City.
[2] 3-year average, 1945–1947.
[3] 5-year median, 1943–47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (latest available estimated population, 33,896,900)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	23.5	0.0	0.0	0.0	1,129	0.0	104.6	0.0	248	0.0	0.0	99
Middle Atlantic	6.0	1.4	7.4	1.9	636	3.2	62.0	0.5	94	0.0	1.4	35
East North Central	4.9	1.8	3.6	1.2	1,399	1.2	46.2	0.0	124	0.0	0.6	68
West North Central	9.9	0.0	19.9	6.0	690	4.0	79.6	0.0	94	0.0	0.0	101
South Atlantic	15.7	0.0	59.4	5.2	297	0.0	85.6	0.0	110	0.0	0.0	37
East South Central	11.8	0.0	484.0	11.8	472	29.5	141.6	0.0	65	0.0	0.0	35
West South Central	0.0	0.0	82.1	10.3	192	0.0	95.8	0.0	41	0.0	0.0	24
Mountain	7.9	0.0	55.6	0.0	1,168	0.0	55.6	7.9	111	0.0	0.0	246
Pacific	4.7	0.0	131.3	6.3	399	6.3	42.7	1.6	81	0.0	3.2	62
Total	7.7	0.9	40.4	3.2	796	3.1	65.6	0.5	108	0.0	0.9	59

Anthrax.—Cases: Philadelphia 3.
Dysentery, amebic.—Cases: New York 5; Chicago 1; St. Louis 2; Los Angeles 2.
Dysentery, bacillary.—Cases: Worcester 1; Minneapolis 1; Los Angeles 5.
Leprosy.—Cases: New York 2; San Francisco 1.
Tularemia.—Cases: Memphis 1.
Typhus fever, endemic.—Cases: New York 1.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—During the month of January 1948, plague infection was reported found in 2 rats in Paia, Island of Maui, T. H., the last being found on January 15, 1948. Under date of February 27, 1948, plague infection was reported in a mass inoculation of tissue from 10 rats found in a gulch in Upper Paia, Island of Maui, and also in a mass inoculation of tissue from 9 rats found in Rainbow Park. Island of Maui, T. H.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended February 7, 1948.—Certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		13		198	419	51	45	56	157	939
Diphtheria				10	2		3	1	1	17
Dysentery, bacillary					3				4	7
German measles				27	15	1		6	22	71
Influenza		249			37				7	293
Mealses		3	5	1,153	1,662	5	5	11	96	2,940
Meningitis, meningococcus				3	4				1	8
Mumps		24	3	254	296	52	98	27	26	780
Poliomyelitis						1	1	2		4
Scarlet fever		13	7	51	74	1		17	12	175
Tuberculosis (all forms)		4	14	80	36	29	11	7	35	216
Typhoid and paratyphoid fever				6					2	8
Undulant fever				4						4
Venereal diseases:										
Gonorrhea	3	8	1	108	58	23	25	31	99	356
Syphilis	1	9	5	64	37	11	12	5	46	190
Other forms									2	2
Whooping cough		21	3	73	43	12	16	76	31	275

NEW ZEALAND

Notifiable diseases—5 weeks ended January 3, 1948.—Certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	6		Malaria	1	
Diphtheria	36	2	Poliomyelitis	161	8
Dysentery, bacillary	14		Puerperal fever	7	
Erysipelas	15		Scarlet fever	62	
Food poisoning	8		Tetanus	6	2
Influenza	1	1	Tuberculosis (all forms)	167	55
Lethargic encephalitis	2	1	Typhoid fever	15	4

NORWAY

Notifiable diseases—November 1947.—Certain notifiable diseases were reported in Norway as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	11	Measles	58
Diphtheria	68	Mumps	1,868
Dysentery	19	Paratyphoid fever	2
Encephalitis, epidemic	1	Pneumonia (all forms)	1,612
Erysipelas	465	Poliomyelitis	29
Gastroenteritis	2,742	Rheumatic fever	147
Gonorrhea	569	Scabies	4,090
Hepatitis, epidemic	234	Scarlet fever	405
Impetigo contagiosa	4,162	Syphilis	116
Influenza	2,376	Tuberculosis (all forms)	481
Laryngitis, including bronchitis	10,468	Weil's disease	2
Malaria	1	Whooping cough	479

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

Plague

Ecuador—Loja Province—Paltas County.—During the week ended January 24, 1948, 1 case of plague was reported in Paltas County, Loja Province, Ecuador.

Siam (Thailand).—Plague has been reported in Siam as follows: Weeks ended—January 31, 1948, 3 cases were reported near the Burma border; February 7, 1948, 16 cases with 7 deaths were reported, including 10 cases with 4 deaths in the extreme northern portion of Siam.

Smallpox

British East Africa—Uganda.—For the week ended January 24, 1948, 39 cases of smallpox were reported in Uganda, British East Africa.

China—Foochow.—For the period January 11–20, 1948, 52 cases of smallpox were reported in Foochow, China.

Siam (Thailand).—Smallpox has been reported in Siam as follows: Weeks ended— January 31, 1948, 67 cases with 7 deaths, including 24 cases in Bangkok and 8 cases in Dhonburi; February 7, 1948, 70 cases with 2 deaths, including 28 cases in Bangkok and 8 cases in Dhonburi.

Venezuela—Puerto La Cruz.—According to information dated February 27, 1948, 41 cases of smallpox (alastrim) had occurred in Puerto La Cruz, Venezuela.

DEATHS DURING WEEK ENDED FEB. 21, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Feb. 21, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	10,655	9,741
Median for 3 prior years	9,474	
Total deaths, first 8 weeks of year	83,951	79,778
Deaths under 1 year of age	776	785
Median for 3 prior years	594	
Deaths under 1 year of age, first 8 weeks of year	5,816	6,581
Data from industrial insurance companies:		
Policies in force	66,865,709	67,313,401
Number of death claims	14,490	13,317
Death claims per 1,000 policies in force, annual rate	11.3	10.3
Death claims per 1,000 policies, first 8 weeks of year, annual rate	10.2	9.7

NOTIFIABLE DISEASES, YEAR 1947

The figures in the following tables are the totals of the monthly morbidity reports received from the State health authorities for the year 1947. These reports are preliminary and the figures are therefore more or less incomplete and subject to correction by final reports. In most instances they include cases reported in both civilian and military populations. The comparisons made are with similar preliminary reports; but, owing to population shifts in many States since the 1940 census, the figures for some States may not be comparable with those for prior years, especially for certain diseases. Each State health officer has been requested to include in the monthly report for his State all diseases that are required by law or regulation to be reported in the State, although some do not do so. The list of diseases required to be reported are not the same for each State. Only 11 of the common communicable diseases are notifiable in all the States. In some instances cases are reported, in some States, of diseases that are not required by law or regulation to be reported and the figures are included although manifestly incomplete. There are also variations among the States in the degree of, and checks on, the completeness of reporting of cases of the notifiable diseases; therefore, comparisons as between States may not be justified for certain diseases. As compared with the deaths, incomplete case reports are obvious for such diseases as malaria, pellagra, pneumonia, and tuberculosis, while in many States other diseases, such as puerperal septicemia, rheumatic fever, and Vincent's infection, are not reportable.

In spite of these known deficiencies, however, these monthly reports, which are published quarterly and annually in consolidated form, have proved of value in presenting early information regarding the reported incidence of a large group of diseases and in indicating trends by providing a comparison with similar preliminary figures for prior years. The table gives a general picture of the geographic distribution of certain diseases, as the States are arranged by geographic areas.

Leaders are used in the table to indicate that no case of the disease was reported.

Consolidated monthly State morbidity reports for the year 1947

Division and State	Anthrax	Chickenpox	Conjunctivitis [1]	Diphtheria*	Dysentery, amebic	Dysentery, bacillary	Dysentery, undefined	Encephalitis, infectious	German measles	Hookworm disease	Influenza	Malaria [2]	Measles*	Meningitis, meningococcus*	Mumps	Ophthalmia [3]	Pellagra	Pneumonia, all forms
NEW ENGLAND																		
Maine	1	3,337	--------	70	2	2	--------	3	190	--------	63	13	4,717	23	1,808	--------	--------	653
New Hampshire	1	691	--------	5	1	1	--------	1	64	--------	327	1	504	15	140	--------	--------	125
Vermont	--------	2,010	--------	15	--------	--------	--------	--------	144	--------	292	--------	5,001	5	601	--------	--------	73
Massachusetts	2	18,785	291	451	10	188	--------	8	929	1	--------	106	12,068	58	8,391	308	--------	[4] 1,343
Rhode Island	--------	955	--------	41	1	8	1	1	32	--------	27	38	5,274	23	310	--------	--------	268
Connecticut	--------	8,432	91	20	12	3	--------	6	334	2	99	73	16,239	50	3,362	1	--------	1,928
MIDDLE ATLANTIC																		
New York	25	26,399	11	692	374	210	--------	44	[5] 1,125	[5] 101	[5] 270	369	15,057	296	[5] 6,284	53	--------	11,704
New Jersey	9	30,661	--------	208	42	3	5	4	1,330	--------	253	100	12,155	100	14,647	6	--------	3,365
Pennsylvania	20	28,347	--------	553	11	16	--------	16	--------	--------	115	9	12,158	243	19,683	20	8	4,504
EAST NORTH CENTRAL																		
Ohio	--------	14,922	9	540	18	4	20	1	367	--------	593	17	19,297	161	7,714	533	--------	2,788
Indiana	--------	3,448	93	417	3	18	17	39	48	--------	1,753	49	2,206	39	1,161	--------	--------	513
Illinois	--------	14,272	381	171	209	62	--------	60	592	3	1,107	208	8,339	205	6,485	--------	--------	4,517
Michigan	--------	14,936	138	216	101	90	--------	5	757	8	555	148	9,583	116	7,190	12	--------	2,260
Wisconsin	--------	24,865	--------	75	5	--------	--------	15	807	--------	3,909	69	13,252	59	9,676	3	--------	[4] 468

WEST NORTH CENTRAL																		
Minnesota	--------	5,437	--------	383	[6] 53	15	8	13	--------	8	70	373	9,347	74	--------	--------	--------	115
Iowa	--------	3,007	--------	100	22	--------	--------	32	22	--------	23,215	24	4,627	63	988	--------	--------	143
Missouri	--------	2,237	1	246	--------	--------	20	6	18	--------	1,329	139	1,156	107	885	--------	--------	1,172
North Dakota	--------	551	15	55	41	--------	--------	91	--------	--------	597	1	1,627	13	--------	--------	--------	543
South Dakota	--------	478	1	49	--------	--------	19	2	--------	--------	36	7	1,291	7	224	--------	--------	100
Nebraska	--------	1,656	--------	48	34	--------	2	19	--------	--------	761	18	473	15	276	--------	--------	184
Kansas	--------	3,541	87	236	3	2	--------	20	98	--------	15,789	19	436	30	1,113	--------	3	811
SOUTH ATLANTIC																		
Delaware	--------	343	--------	10	--------	1	--------	--------	--------	--------	--------	--------	65	8	72	--------	--------	35
Maryland	--------	3,322	1	316	6	8	44	2	111	--------	203	10	920	63	1,539	11	1	1,318
District of Columbia	--------	1,337	--------	8	4	10	--------	2	--------	--------	28	3	576	24	829	--------	1	880
Virginia	--------	3,964	--------	272	17	--------	4,494	10	--------	--------	35,184	93	7,991	102	2,066	--------	25	2,879
West Virginia	--------	898	--------	193	1	2	--------	3	64	--------	13,841	7	3,126	63	682	7	1	670
North Carolina	--------	--------	--------	752	20	12	--------	4	--------	--------	--------	137	4,978	95	--------	--------	--------	--------
South Carolina	--------	3,259	--------	467	117	492	--------	24	343	1,448	29,734	4,808	3,227	32	1,120	28	746	4,181
Georgia	--------	1,959	67	417	20	113	6	--------	--------	4,325	5,753	173	3,407	41	310	--------	22	848
Florida	--------	1,994	86	292	59	5	11	5	67	4,683	1,092	140	1,317	49	926	30	17	682
EAST SOUTH CENTRAL																		
Kentucky	--------	1,363	1	403	6	9	--------	9	54	--------	93,660	126	661	90	1,282	--------	1	950
Tennessee	--------	1,944	5	369	39	38	29	15	108	17	5,717	217	1,893	93	959	3	47	2,439
Alabama	--------	1,914	--------	358	17	--------	--------	4	59	--------	10,508	1,551	3,810	103	751	--------	31	2,252
Mississippi	--------	550	--------	360	119	118	--------	2	--------	1,958	2,998	914	489	42	337	53	18	1,033
WEST SOUTH CENTRAL																		
Arkansas	7	1,232	1	248	248	102	218	1	73	30	25,046	1,323	2,442	40	619	5	27	1,677
Louisiana	--------	566	--------	241	317	40	--------	8	21	313	1,565	213	1,268	74	695	3	3	2,015
Oklahoma	1	960	--------	202	72	16	47	8	71	72	25,096	616	168	58	658	5	17	1,363
Texas	1	17,243	--------	1,125	768	15,095	3,108	3	--------	--------	116,564	4,855	8,297	245	17,202	96	572	9,213
MOUNTAIN																		
Montana	--------	1,512	1	51	2	3	3	11	161	--------	3,282	3	5,034	18	1,616	--------	--------	313
Idaho	--------	1,058	67	22	3	7	2	1	107	--------	1,440	16	267	6	1,361	--------	--------	353
Wyoming	--------	629	19	18	3	--------	1	3	97	--------	262	9	446	10	178	--------	--------	130
Colorado	--------	5,640	--------	283	5	16	--------	14	626	--------	9,114	9	1,788	36	3,101	--------	--------	1,172
New Mexico	--------	943	12	68	16	42	41	6	28	--------	133	21	1,336	5	559	--------	10	989
Arizona	--------	2,077	10	133	6	2	1,133	7	135	--------	4,943	47	1,587	12	1,049	9	5	1,492
Utah	--------	4,604	--------	113	3	1	3	4	183	1	1,180	48	518	7	3,351	--------	--------	298
Nevada	--------	571	34	1	--------	8	--------	3	--------	--------	15	4	63	5	568	--------	--------	169
PACIFIC																		
Washington	1	8,778	346	187	102	18	187	9	860	--------	1,785	13	1,307	52	3,726	--------	--------	707
Oregon	--------	2,462	64	109	28	4	7	9	--------	2	1,491	28	897	42	1,767	--------	--------	923
California	3	37,476	31	796	190	195	--------	116	2,632	--------	1,545	152	8,430	282	17,591	--------	--------	[4] 1,497
Total	71	317,565	1,863	12,405	3,130	16,979	9,516	669	12,657	12,972	443,339	17,317	221,115	3,399	155,852	1,196	1,555	77,995
Year 1946	36	225,020	1,104	16,423	4,073	24,164	6,456	664	59,151	15,236	284,138	47,894	681,184	5,602	159,654	1,445	3,891	104,098
Median 1942-46	44	299,779	[7] 1,329	16,421	3,341	30,872	9,421	667	59,151	16,104	452,101	55,693	612,068	8,035	196,317	1,627	4,483	128,473
Alaska	--------	230	--------	5	1	--------	4	--------	24	--------	412	--------	25	3	18	--------	--------	38
Hawaii Territory	--------	2,252	10	11	21	77	--------	1	171	7	35	[8] 19	70	8	1,358	--------	--------	[4] 64
Panama Canal Zone [9]	--------	200	--------	401	22	59	--------	1	--------	--------	--------	497	80	9	37	--------	--------	[10] 204

See footnotes on p. 392.

Consolidated monthly State morbidity reports for the year 1947—Continued

ivision and State	Polio-myelitis*	Rabies in man	Rheumatic fever	Rocky Mountain spotted fever	Scarlet fever*	Septic sore throat	Small-pox*	Tetanus	Trachoma	Trichinosis	Tuberculosis, all forms*	Tuberculosis, respiratory	Tularemia	Typhoid fever*	Paratyphoid fever	Typhus fever, endemic	Undulant fever*	Vincent's infection	Whooping cough*
NEW ENGLAND																			
ne	44	-------	-------	-------	770	26	-------	3	-------	-------	540	514	-------	10	6	-------	33	26	1,033
Hampshire	30	-------	-------	-------	458	110	-------	1	-------	13	135	11	-------	10	1	-------	24	69	377
nont	40	-------	-------	-------	102	2	-------	-------	-------	-------	176	91	-------	8	3	-------	137	-------	1,260
sachusetts	347	-------	-------	3	4,435	112	-------	11	7	59	2,907	2,709	8	25	159	-------	76	-------	7,125
de Island	144	-------	53	-------	471	14	-------	2	-------	2	508	544	-------	9	3	-------	18	8	1,314
necticut	135	-------	-------	-------	1,276	190	-------	12	1	17	1,206	1,141	-------	14	4	1	181	-------	2,974
MIDDLE ATLANTIC																			
York	1,180	-------	-------	19	[11] 10,387	-------	12	38	-------	193	13,479	12,875	3	120	21	18	262	-------	10,094
Jersey	295	1	-------	25	3,474	[12] 142	1	4	-------	25	3,166	-------	3	46	16	-------	43	-------	8,255
nsylvania	477	-------	953	19	6,635	-------	-------	6	1	7	4,555	-------	8	204	[11] 19	2	98	-------	9,785
ST NORTH CENTRAL																			
)	1,465	1	83	11	10,529	75	13	12	3	13	7,213	-------	10	102	[11] 14	4	99	18	10,451
ana	259	-------	1	23	3,021	182	29	11	-------	2	2,646	2,507	54	110	[11] 10	1	115	12	2,310
ois	852	-------	186	28	4,061	133	2	29	10	4	7,921	7,389	124	137	6	1	555	210	4,792
igan	653	-------	362	-------	4,819	207	1	20	1	5	6,470	-------	6	78	[11] 112	2	304	-------	10,483
onsin	204	-------	-------	-------	2,463	105	5	-------	3	-------	2,729	-------	8	26	1	-------	430	-------	7,827
ST NORTH CENTRAL																			
Minnesota	252	-------	116	-------	1,977	307	1	4	2	36	2,028	-------	7	16	[11] 22	-------	331	48	2,671
Iowa	176	-------	8	3	1,398	32	2	1	-------	-------	670	-------	7	46	4	-------	902	-------	1,180
Missouri	132	1	68	10	1,249	72	11	-------	-------	-------	3,459	-------	87	83	6	-------	141	8	1,504
North Dakota	74	-------	8	-------	314	14	4	-------	27	-------	301	254	-------	6	7	-------	3	40	402
South Dakota	26	-------	-------	3	279	7	4	-------	13	-------	338	-------	-------	11	2	-------	80	5	154
Nebraska	201	-------	2	-------	975	-------	6	-------	-------	2	469	-------	-------	13	3	-------	95	-------	692
Kansas	91	-------	9	-------	1,395	16	13	9	6	-------	957	926	25	15	8	6	151	188	1,830
SOUTH ATLANTIC																			
Delaware	115	-------	-------	5	315	1	-------	-------	1	-------	232	232	-------	7	1	-------	7	-------	227
Maryland	108	-------	117	66	1,039	109	-------	6	-------	2	2,717	2,627	13	40	[13] 10	6	33	2	3,932
District of Columbia	23	-------	-------	7	403	-------	-------	-------	-------	-------	[12] 999	[14] 975	7	6	3	1	-------	-------	624
Virginia	175	-------	-------	67	1,316	2,076	-------	18	-------	-------	4,180	3,207	60	125	36	10	70	-------	4,248
West Virginia	145	-------	12	7	915	46	3	4	-------	-------	2,428	[15] 1,547	3	75	5	-------	15	2	1,056

North Carolina	302	2	-------	88	1, 167	44	2	-------	-------	-------	3, 604	3, 496	74	50	8	52	21	-------	2, 983
South Carolina	[10] 66	-------	547	4	285	6, 121	2	27	-------	1	442	-------	28	84	9	63	48	-------	4, 283
Georgia	81	1	51	19	618	194	3	17	-------	-------	2, 633	2, 074	103	78	47	436	148	60	1, 298
Florida	113	-------	-------	2	335	122	-------	27	-------	-------	4, 395	4, 395	8	66	[13] 45	206	67	152	1, 868
EAST SOUTH CENTRAL																			
Kentucky	129	-------	15	31	1, 397	70	5	3	42	-------	2, 101	2, 059	21	162	19	10	17	6	1, 568
Tennessee	171	8	67	23	1, 543	316	6	32	4	3	5, 433	-------	92	104	14	33	88	239	1, 849
Alabama	50	3	-------	9	538	-------	1	39	-------	-------	3, 054	-------	23	42	1	191	124	-------	2, 367
Mississippi	61	1	-------	1	310	-------	4	-------	-------	-------	2, 077	2, 007	82	58	-------	65	86	-------	507
WEST SOUTH CENTRAL																			
Arkansas	83	1	-------	6	186	848	4	32	234	1	2, 010	1, 982	208	102	9	19	48	-------	1, 689
Louisiana	54	-------	80	2	217	201	2	40	-------	-------	2, 147	2, 052	54	153	20	122	44	-------	498
Oklahoma	57	-------	-------	35	352	186	4	6	200	-------	2, 262	1, 424	117	93	70	3	88	20	1, 025
Texas	183	1	-------	3	1, 504	1, 828	15	-------	97	-------	8, 808	-------	41	317	58	610	460	-------	21, 558
MOUNTAIN																			
Montana	25	-------	11	6	453	85	-------	-------	73	-------	565	331	6	24	1	-------	6	-------	536
Idaho	352	-------	41	11	348	261	3	-------	7	3	135	-------	2	15	11	-------	31	44	516
Wyoming	18	-------	-------	9	192	58	1	-------	1	-------	49	-------	15	5	[13] 2	-------	1	13	211
Colorado	67	-------	237	11	1, 583	500	1	-------	-------	-------	1, 694	-------	5	26	9	-------	183	19	2, 347
New Mexico	40	-------	14	-------	300	14	11	3	91	-------	[6] 1, 462	[6] 1, 359	1	25	2	1	3	-------	826
Arizona	36	-------	-------	-------	296	30	-------	-------	225	-------	2, 185	1, 375	-------	41	5	1	21	-------	1, 232
Utah	28	-------	79	4	562	53	-------	-------	-------	-------	78	71	35	4	[13] 1	-------	89	-------	538
Nevada	7	-------	4	1	96	64	-------	-------	11	5	202	-------	3	3	-------	-------	1	52	90
PACIFIC																			
Washington	171	-------	307	-------	1, 503	169	-------	5	-------	1	2, 099	-------	-------	23	[13] 16	-------	65	1, 091	1, 519
Oregon	110	-------	54	2	917	169	-------	1	2	2	870	828	-------	56	11	-------	19	-------	708
California	878	1	901	2	5, 105	504	2	65	41	32	9, 590	8, 964	9	180	166	37	286	-------	9, 375
Total	10, 734	21	4, 386	565	84, 379	15, 905	173	488	1, 103	428	130, 474	70, 056	1, 360	3, 062	[13] 1, 006	1, 901	6, 147	2, 332	155, 991
Year 1946	25, 196	27	4, 515	566	113, 076	9, 525	356	470	1, 618	317	117, 910	64, 627	1, 221	3, 275	[13] 966	3, 371	5, 695	2, 278	108, 718
Median 1942-46	13, 514	29	[7] 4,515	448	142, 274	7, 787	384	436	2, 545	307	117, 910	67, 786	887	[7] 4, 221	[7] 741	4, 517	4, 286	2, 278	132, 814
Alaska	-------	-------	-------	-------	12	70	-------	-------	-------	-------	1, 304	1, 048	-------	17	-------	-------	1	2	4
Hawaii Territory	37	-------	1	-------	7	31	-------	14	-------	-------	1, 609	1, 474	-------	2	5	46	2	-------	1, 147
Panama Canal Zone [9]	26	-------	-------	-------	2	-------	-------	-------	-------	-------	[10] 37	-------	-------	7	5	11	-------	-------	[10] 6

See *footnotes* on p. 392.

FOOTNOTES FOR TABLE ON PAGES 388 TO 391

*Diseases marked with an asterisk (*) are reportable by law or regulation in all the States, including the District of Columbia. Typhoid fever is reportable in all the States; paratyphoid fever in all except 6 States. Syphilis is reportable in all the States and the District of Columbia but is not included in the table. Some States have increased and some have reduced the list of reportable diseases since the latest published compilation of reportable diseases (PUBLIC HEALTH REPORT 59:317-340) (Mar. 10, 1944. Reprint No. 2544).

[1] Includes cases of kerato- and suppurative conjunctivitis and of pink eye.
[2] In a few States practically all contracted outside the United States.
[3] Reported as ophthalmia neonatorum.
[4] Lobar pneumonia only.
[5] New York City only.
[6] Includes cases of nonresidents.
[7] 3 year (1944-46) median.
[8] Off-shipping.
[9] Includes the cities of Colon and Panama.
[10] In the Canal Zone only.
[11] Includes septic sore throat.
[12] Included in scarlet fever
[13] Includes cases reported as salmonella infection.
[14] For 6 months only.
[15] For 8 months only.
[16] Figures corrected by later reports.

The following list includes certain rare conditions, diseases of restricted geographical distribution, and those reportable in or reported by only a few States; last year's figures in parentheses (where no figures are given, no cases were reported last year):

Actinomycosis: Massachusetts 1, Illinois 3 (4), Minnesota 16 (12), Nebraska 1, Kansas 1,
Oklahoma 1, Nevada 1, Hawaii Territory 1.

Botulism: Maine 1, Connecticut 2, New York 2, New Jersey 1, Maryland 4, Kentucky
4, Tennessee 2 (1), Montana 1, Colorado 1, New Mexico 6 (7), Washington 9, Oregon 2,
California 6 (5).

Coccidioidomycosis: Arizona 2 (17), Washington 1, California 54 (40).

Colorado tick fever: Wyoming 4 (3), Colorado 69 (31).

Dengue: South Carolina 14 (10), Mississippi 1 (1), Louisiana 1, Texas 19 (21).

Dermatitis: New Hampshire 15 (15), Missouri 117 (359), Arkansas 3.

Diarrhea: New York 278 (139), New Jersey 41 (38), Pennsylvania 138 (32), Ohio 709
(581) includes enteritis, Indiana 4, Illinois 92 (131), Michigan 17 (5), North Dakota 4
(6), Kansas 116 includes enteritis, Maryland 96 (102), South Carolina 12,846 (9,995),
Florida 68 (52), Kentucky 74, Oklahoma 2, Idaho 2 (1), Colorado 3 (27) includes en-
teritis, New Mexico 120 (140), Washington 83, Oregon 48 (35) includes enteritis, Cal-
ifornia 168 (160).

Dog bite: New Hampshire 10, Illinois 13,246 (12,545) includes all animals, Michigan
8,034 (8,027), Arkansas 594 (697) includes all animals.

Favus: Kentucky 3.

Filariasis: Minnesota 2 (1).

Food poisoning: Maine 3 (140), New Hampshire 4, New Jersey 20 (6), Ohio 23 (3), In-
diana 18 (14), Illinois 79 (35), Minnesota 124, Kentucky 2, Louisiana 20 (23), Oklahoma
8, Idaho 6 (11), Colorado 7, New Mexico 29 (2), Nevada 2 (6), Washington 481 (55),
Oregon 48 (3), California 1,093 (424).

Granuloma, unspecified: Kentucky 1.

Granuloma inguinale: Missouri 10 (20), West Virginia 2, Florida 271 (257), Tennessee
74 (98), Mississippi 395 (661), Louisiana 209 (300), Arizona 1 (3), California 7.

Impetigo contagiosa: New York 71 (141), Ohio 32 (29), Indiana 99 (100), Illinois 36 (43),
Michigan 1,540 (1,304), Missouri 55 (5), North Dakota 6 (22), Nebraska 4, Kansas 58
(27), Maryland 10 (9), Kentucky 24 (14), Montana 40 (41), Idaho 80 (65), Wyoming 27
(37), Colorado 66 (47), Nevada 152 (106), Washington 1,044 (936), Oregon 1, Alaska 7,
Hawaii Territory 61 (27).

Jaundice (including hepatitis and Weil's disease): Maine 32 (19), New Hampshire 4,
Rhode Island 1, New York 599 (409), Pennsylvania 49 (40), Ohio 7 (6), Indiana 6 (63),
Illinois 27 (90), Michigan 13 (33), Minnesota 29 (61), North Dakota 12 (7), South
Dakota 6, Maryland 8 (16), South Carolina 8 (6), Florida 29 (27), Kentucky 5, Ten-
nessee 21 (7), Oklahoma 1, Idaho 20 (39), Wyoming 6, Utah 9 (23), Washington 17 (53),
Oregon 79 (76), California 166 (279), Hawaii Territory 7 (9).

Lead poisoning: New Hampshire 1, Colorado 1.

Leprosy: New York 5 (2), Pennsylvania 1, Ohio 2, Minnesota 1, Kansas 1, Florida 2 (8),
Mississippi 1, Arkansas 1, Louisiana 7 (4), Texas 16 (8), California 13 (7), Hawaii
Territory 29 (33), Panama Canal Zone 1 (1).

Lymphocytic choriomeningitis: Massachusetts 6 (4), Minnesota 5, Tennessee 13 (21).

Lymphogranuloma venereum: Missouri 26 (31), Florida 216 (175), Tennessee 99 (140),
Louisiana 105 (106).

Plague (human): California 1.

Psittacosis: New York 1 (1), Ohio 5, Michigan 7 (4), California 9 (6).

Puerperal septicemia: New York 2, Florida 2 (3), Tennessee 3 (4), Mississippi 8 (239),
Louisiana 11 (13), New Mexico 4 (3).

Rabies in animals: New York 649 (1,161), New Jersey 93, Ohio 761 (886), Indiana 72,
Illinois 257 (363), Michigan 313 (12), Minnesota 1, Nebraska 10, Kansas 52 (28), Mary-
land 9 (30), West Virginia 8 (2), South Carolina 183 (154), Florida 436 (62), Alabama
473 (712), Arkansas 93 (159), Louisina 17 (45), Texas 1,071 (1,034), Colorado 13 (7), New
Mexico 6 (12), Arizona 50, Utah 7 (12), California 292 (402), Alaska 2.

Rat bite fever: Indiana 1, Tennessee 1 (4), Louisiana 1 (1), Oklahoma 1.

Relapsing fever: Texas 62 (29), Nevada 8 (2), Oregon 1, California 24 (17), Panama Canal
Zone 1 (3).

Ringworm disease: Pennsylvania 1,628 (1,543), Ohio 79 (185), Illinois 2,543 (488), Michi-
gan 1,639 (1,385), Minnesota 51 (146), Iowa 761 (37), Missouri 16 (7), Kansas 18 (7),
Maryland 4 (2), Kentucky 48, Montana 4 (6), Idaho 66 (77), Wyoming 1 (2), Utah 218
(250), Nevada 6 (2), Washington 874 (689).

Scabies: Rhode Island 13 (2), Pennsylvania 529 (567), Ohio 84 (18), Indiana 3 (1), Michi-
gan 1,092 (1,241), Missouri 87 (41), North Dakota 16 (16), South Dakota 2, Kansas 113
(123), Kentucky 45 (25), Montana 104 (73), Idaho 210 (203), Wyoming 21 (8), Nevada
36 (74), Alaska 4.

Silicosis: New Hampshire 1 (4), Kansas 2, Arkansas 3, Idaho 2, Wyoming 1, New Mexico
11 (10), Washington 5.

Yaws: Kansas 1.

EXAMINATION FOR REGULAR CORPS

United States Public Health Service

A competitive examination for appointment in the Regular Corps of the United States Public Health Service in the grade of assistant surgeon (first lieutenant) and senior assistant surgeon (captain) will be held in April. The written examination will be conducted on April 5, 6, and 7 at places convenient to the candidate. Applicants who have passed the national board examinations may substitute the results for the written portion of the examination. The oral examination will be held at various points throughout the country.

All applicants must be at least 21 years of age and citizens of the United States, must present a diploma of graduation from a recognized medical school, and satisfactorily pass a physical examination performed by Public Health Service officers.

Applicants for the grade of assistant surgeon must have had at least 7 years of educational and professional training or experience, exclusive of high school. Applicants for the grade of senior assistant surgeon must have had at least 11 years of educational and professional training or experience, exclusive of high school.

Entrance pay for an assistant surgeon with dependents is $5,011 a year and for senior assistant surgeon with dependents $5,551 a year. This includes the additional pay of $1,200 for medical officers, as well as subsistence and rental allowance. Provisions are made for promotions at regular intervals up to and including the grade of senior surgeon (lieutenant colonel) and for selection for promotion to grade of medical director (colonel) at $9,751 a year. Retirement is authorized at either completion of 30 years' service or at age of 64. Full medical care including disability retirement at three-fourths pay is provided.

Application forms may be obtained from Public Health Service Hospitals, District Offices or by writing to the Surgeon General, United States Public Health Service, Washington 25, D. C.

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948

For sale by the Superintendent of Documents, United States Government Printing Office Washington 25, D. C.

Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 MARCH 26, 1948 NUMBER 13

IN THIS ISSUE

Incidence of Poliomyelitis in 1947
Poliomyelitis in England and Wales in 1947
Coverage in DDT Spraying for Mosquito Control
Incidence of Communicable Diseases in the U. S.

U.S. PUBLIC HEALTH SERVICE
1798

CONTENTS

Page
Incidence of poliomyelitis in 1947. C. C. Dauer 393
Poliomyelitis in England and Wales in 1947. W. H. Bradley and A. H. Gale 397
Quarantine notices—Pakistan 400
The importance of coverage in DDT residual house spraying for control of *Anopheles Quadrimaculatus* mosquitoes. R. H. McCauley, R. W. Fay, and S. W. Simmons 401
Incidence of communicable diseases in the United States, February 1–28, 1948 408

INCIDENCE OF DISEASE

United States:

Reports from States for week ended March 6, 1948, and comparison with former years 411
Weekly reports from cities:
City reports for week ended February 28, 1948 415
Rates, by geographic divisions, for a group of selected cities 417
Deaths during week ended February 28, 1948 417

Foreign reports:

Canada—Provinces—Communicable diseases—Week ended February 14, 1948 418
New Zealand—Notifiable diseases—4 weeks ended January 31, 1948 418
Smallpox vaccination requirement in Venezuela 418
World distribution of cholera, plague, smallpox, typhus fever, and yellow fever—
Cholera 419
Plague 420
Smallpox 421
Typhus fever 423
Yellow fever 424
Health Program Specialist (Inside back cover)

Public Health Reports

Vol. 63 • MARCH 26, 1948 • *No. 13*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

INCIDENCE OF POLIOMYELITIS IN 1947

By C. C. Dauer, *Epidemiologist, District of Columbia Health Department*

In the United States the number of reported cases of poliomyelitis in 1947 was smaller than for any year since 1942. Compared with 1946, there was a reduction amounting to almost 15,000 cases or 60 percent. The provisional rate of incidence for 1947 (table 1) was 7.4 per 100,000 population.[1] Only four States reported definitely higher rates in 1947 than in the previous year (table 2).

Table 1.—*Number of poliomyelitis cases and deaths, case and death rates per 100,000 population, and number of cases reported per death in the United States, 1942–46*

	Total cases reported	Total deaths registered [1]	Case rate	Death rate	Cases reported per death
1942	4,033	561	3.0	0.4	7.2
1943	12,449	1,151	9.3	.8	11.1
1944	19,029	1,361	14.3	1.1	13.3
1945	13,619	1,186	10.3	.9	11.4
1946	25,191	1,845	19.0	1.3	13.6
1947	10,734	(2)	7.4	(2)	(2)

[1] From reports of the National Office of Vital Statistics.
[2] Not available.

During the early part of 1947 the incidence of reported cases remained high for the country as a whole which was a carry-over of the high incidence in 1946 but after the middle of March the number of cases reported weekly remained relatively low compared with 1946.

Poliomyelitis occurred in epidemic proportions in relatively small areas in contrast to the widespread epidemicity in the previous year (table 2 and fig. 1). The States reporting the greatest number of cases were Ohio with 1,465 cases, New York with 1,189, California with 878, Illinois with 852, and Michigan with 653, but all of these States have large populations and with the exception of Ohio none of them had relatively high rates. The highest incidence per 100,000 population occurred in Idaho (72.1), Delaware (39.2), Rhode Island (18.9), Ohio (18.8), and in Nebraska (15.4). None of these latter States are contiguous.

---

[1] All morbidity data for 1947 used in this report are provisional. Data for prior years are from final reports submitted by States to the U. S. Public Health Service.

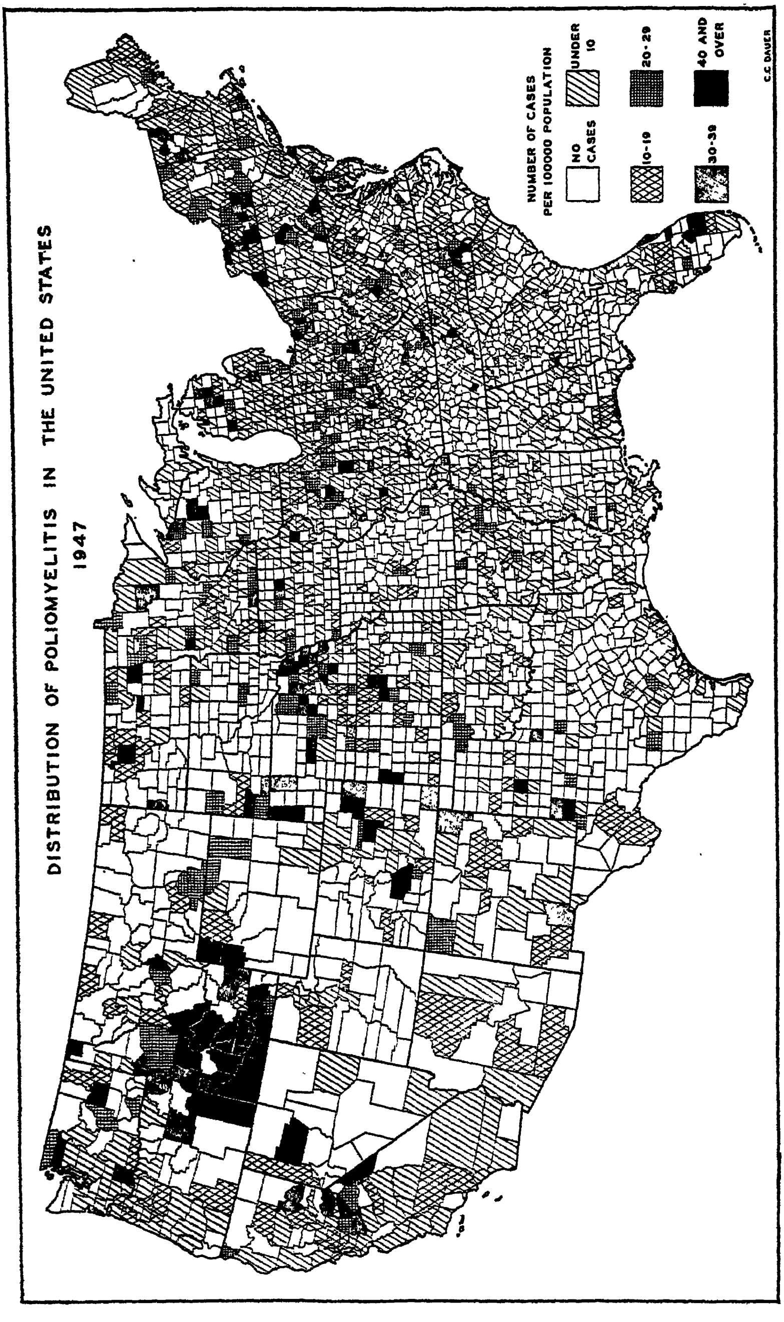

DISTRIBUTION OF POLIOMYELITIS IN THE UNITED STATES
1947
NUMBER OF CASES
PER 100000 POPULATION
NO CASES
UNDER 10
10-19
20-29
30-39
40 AND OVER
C.C DAUER

FIGURE 1.

The largest area where the disease was epidemic included most of the counties in southern Idaho, and a few in eastern Oregon and western Wyoming. In Idaho a group of 4 small adjoining counties, (Ada, Canyon, Gem and Payette) located in the southwestern part, reported 161 or 46 percent of Idaho's total of 352 cases. These four counties contain 3 percent of the land area and 20 percent of the

TABLE 2.—*Poliomyelitis morbidity and mortality rates per 100,000 population in the United States, 1944–47*

	Morbidity rates				Mortality rates [1]		
	1944	1945	1946	1947	1944	1945	1946
United States	14.3	10.3	19.5	7.4	1.0	0.9	1.3
New England:							
Maine	2.7	11.3	5.1	4.8	.4	.8	.3
New Hampshire	15.0	7.5	41.5	5.5	2.2	1.1	2.8
Vermont	13.3	19.3	23.2	10.9	.6	1.0	1.4
Massachusetts	10.6	12.6	9.2	7.3	.4	.5	.5
Rhode Island	1.8	1.1	11.9	18.9	0	.1	.9
Connecticut	12.5	11.9	6.8	6.6	.6	.6	.8
Middle Atlantic:							
New York	48.9	14.4	10.8	8.4	2.7	.7	.5
New Jersey	13.5	22.6	6.1	6.6	1.3	2.4	.6
Pennsylvania	15.7	8.5	3.7	4.6	1.3	.6	.3
East North Central:							
Ohio	17.1	6.7	10.4	18.8	1.3	.4	.8
Indiana	9.9	5.9	13.2	6.7	.9	.7	1.3
Illinois	7.4	14.3	33.1	10.3	.5	1.4	2.3
Michigan	16.4	3.9	19.9	10.4	.9	.4	1.4
Wisconsin	9.3	20.2	43.0	6.2	1.0	1.9	2.7
West North Central:							
Minnesota	22.1	11.5	127.4	8.7	1.5	1.2	7.5
Iowa	9.0	19.1	28.0	6.7	.7	1.1	2.0
Missouri	5.3	8.4	35.6	3.4	.4	.8	2.5
North Dakota	9.9	3.2	88.6	13.4	.4	.6	4.7
South Dakota	1.5	3.8	68.4	4.6	.5	.2	6.4
Nebraska	5.5	10.0	53.9	15.4	.8	1.0	4.2
Kansas	6.9	7.4	61.4	4.7	.6	1.0	4.8
South Atlantic:							
Delaware	33.9	10.1	11.1	39.2	2.1	1.0	1.0
Maryland	25.6	6.0	6.1	4.9	1.2	.2	.3
District of Columbia	21.5	14.8	4.0	2.7	1.3	1.1	.5
Virginia	27.3	10.9	4.6	5.8	1.8	.9	.5
West Virginia	12.8	3.8	4.4	7.8	1.4	.6	.4
North Carolina	26.7	4.5	4.4	8.1	1.1	.4	.4
South Carolina	3.1	9.9	1.1	3.4	.7	1.3	.4
Georgia	3.5	4.0	5.1	2.5	.4	.4	.3
Florida	5.0	6.0	23.9	4.7	.4	.6	1.8
East South Central:							
Kentucky	30.1	2.6	4.4	4.6	1.8	.5	.5
Tennessee	4.7	15.2	6.3	5.5	.6	1.6	.6
Alabama	3.8	5.4	13.4	1.7	.4	.9	.8
Mississippi	6.4	3.8	16.4	2.9	.4	.5	.8
West South Central:							
Arkansas	2.5	3.9	22.9	4.3	.3	.9	1.4
Louisiana	6.8	5.5	15.5	2.1	.5	.5	.9
Oklahoma	2.7	9.8	21.3	2.4	.4	.7	1.5
Texas	3.8	14.7	14.4	2.5	.7	1.9	1.4
Mountain:							
Montana	8.3	17.9	28.1	5.1	1.3	2.2	1.0
Idaho	3.2	4.8	9.6	72.1	.2	.8	.4
Wyoming	4.2	9.7	49.4	6.6	0	.8	2.5
Colorado	6.0	13.0	80.3	5.8	1.0	1.2	4.8
New Mexico	4.7	4.7	31.0	7.3	.8	.4	1.8
Arizona	6.0	4.0	23.3	5.5	1.1	.5	1.8
Utah	4.2	41.3	24.0	4.4	0	3.2	1.4
Nevada	7.1	6.8	10.0	5.0	0	1.8	2.1
Pacific:							
Washington	10.7	15.9	24.8	7.6	.9	1.2	1.5
Oregon	20.4	5.7	12.8	7.2	2.3	.6	.6
California	6.2	10.3	24.8	8.9	.4	.6	1.0

---

[1] Mortality rates by place of residence from reports of National Office of Vital Statistics.

population of the State. The rates varied from 142 to 167 per 100,000 population and although this group of counties had the highest incidence for any contiguous group in the United States in 1947 they were well below those for many groups of counties in 1946. The epidemic in southern Idaho occurred relatively late in the year, for in some counties the peak in incidence was not reached until November. However, cases were reported in various parts of the State throughout the early part of the year. The incidence for the State as a whole was higher than for any prior year for which data are available, the highest rate previously reported was 33.0 in 1934 when 156 cases were reported.

There were small areas in other parts of the country in which poliomyelitis was also epidemic (fig. 1). They were located in north central California, in Nebraska, northern Michigan, south central and northern Ohio, central North Carolina, Delaware, central Pennsylvania, western New York, Rhode Island, and northern Vermont. The usual number of scattered counties with high rates (40 or more cases per 100,000 population) due to one or more cases occurring in a a very small population also appear on the map showing the distribution of the disease.

In 1946 poliomyelitis outbreaks were widespread not only in the United States but also in other parts of the Western Hemisphere, namely, in Canada, Cuba, Puerto Rico, and in certain Central and South American countries. There was no unusual prevalence in any of these areas in 1947 except in Canada. In the latter country about 2,500 cases were reported in 1946 and about 2,300 in 1947. The incidence was high in some of the eastern Provinces in 1946 and in the western Provinces in the past year (table 3).

TABLE 3.—*Poliomyelitis morbidity rates per 100,000 population in the Provinces of Canada in 1946 and 1947*

	1946	1947		1946	1947
Prince Edward	84.2	2.1	Manitoba	6.4	86.4
Nova Scotia	8.0	11.8	Saskatchewan	4.1	30.5
New Brunswick	15.5	4.1	Alberta	8.3	10.3
Quebec	48.4	4.1	British Columbia	2.7	37.6
Ontario	13.5	20.9			

In 1947 poliomyelitis occurred in epidemic proportions in several European countries. As reported elsewhere in this issue England and Wales recorded a higher incidence than for any previous year. The epidemic also appeared earlier than the usual seasonal occurrence of the disease. Higher incidence rates were also reported in Scotland, in certain parts of Germany, especially Berlin, in Austria, the Netherlands, Hungary, and Belgium.

POLIOMYELITIS IN ENGLAND AND WALES IN 1947[1]

By W. H. Bradley, D. M., M. R. C. P., *Senior Medical Officer, and* A. H. Gale, D. M., *Medical Officer, Ministry of Health, London*

INCIDENCE AND MORTALITY

Some of the figures, notably those of deaths and of corrected notifications for the whole year, necessary for a full analysis of the recent epidemic are not yet available, but this short note based on present information may well preface the article which follows.

Incidence.—Original notifications of poliomyelitis and polioencephalitis, together for the 52 weeks ended December 27, were 9,199 (there were in addition 63 original notifications in the week ended January 3, 1948, which are included in the Registrar-General's year for weekly returns, i. e., 53 weeks in 1947). In 1938, the year of highest recorded incidence prior to 1947, before the present machinery for correction of notifications was instituted, there were 1,581 notifications of civilians, giving an attack rate of 3.8 per 100,000 population.

"Corrected" notifications of poliomyelitis and polioencephalitis for 1947 are likely to be between 7,500 and 7,600, giving an attack rate of about 18 per 100,000 population.

Mortality.—In 1938 there were 254 deaths, a crude death rate of 6 per million living and a case fatality rate of 16 percent. If the case fatality rate in 1947 proves to be rather lower—perhaps 10 percent—deaths are likely to number about 750, giving a crude death rate of about 18 per million living.

HOSPITAL INQUIRY

In October 1947, a questionnaire sent to a large number of hospitals throughout England and Wales brought 270 replies. The object was to gain information about the probable results of the epidemic. Hospitals were asked to include in the return all patients admitted between January 1 and October 11, 1947, with a tentative diagnosis of poliomyelitis or polioencephalitis. A copy of the questionnaire with notes on completion appears in the full report in the Bulletin of the Ministry of Health. The returns received relate to 6,762 patients admitted and in 4,717 the diagnosis of poliomyelitis or polioencephalitis was confirmed.

Size of sample.—It is not possible to relate hospital admissions and notifications directly because some practitioners notify cases on suspicion, whereas others wait until the diagnosis is confirmed in hospital. The Registrar-General supplies two sets of notification statistics, those published in the weekly returns which are described as original notifications and those published in the quarterly returns which are described as corrected notifications. In the first three-quarters of 1947 there were 6,917 original and 5,765 corrected notifications. Assuming that the same ratio of original to corrected holds good for the slightly longer period January 1 to October 11, it means that the confirmed hospital cases (4,717) should include about 76 percent of the corrected notifications—a large sample.

---

[1] Condensed from the Monthly Bulletin of the Ministry of Health and Public Health Laboratory Service, vol. 7, March 1948, by kind permission of the Controller, H. B. M. Stationery Office.

Table 1 shows about one-third of the patients under age 5, about one-third between 5 and 15, and one-third over 15, However, only 14 percent of the deaths occurred in children under 5, 21 percent in children between 5 and 15, and 65 percent in persons over 15. The last column of the table expresses the increased fatality with age. It is possible that this may be due to some extent to a tendency for slight cases to be missed in older persons but this can hardly be a complete explanation.

TABLE 1.—*Age distribution of confirmed hospital cases and of deaths*

Age group (years)	Total number of cases	Paralytic cases	Deaths	Case mortality (percent)
All ages	4,717	3,461	[1] 360	7.6
Under 1 year	181	156	10	5.5
1–4	1,235	995	40	3.2
5–14	1,658	1,129	77	4.6
15–24	853	591	88	10.3
25–34	525	394	88	16.8
35–44	216	159	40	18.5
45 and over	49	37	17	34.7

[1] Includes 27 fatal nonparalytic cases.—Ed.

Type of the 4,717 confirmed cases.—2,976 patients (63 percent) had paralysis chiefly affecting the limbs or trunk; 485 (10.3 percent) had paralysis chiefly affecting cranial nerves; 1,097 (23.3 percent) had no paralysis but were diagnosed on the changes in the cerebrospinal fluid (769 cases) or on clinical grounds only (328 cases). In 159 patients, (3.4 percent) the symptoms and signs were indefinite but the diagnosis was made because of close contact with a definite case.

Degree of severity of the 3,461 paralytic cases.—333 were fatal and of the 3,128 in which the patient recovered 1,285 (41.1 percent) were classed as "mild"; 1,205 (38.5 percent) as of "moderate" severity and 638 (20.4 percent) as "severe." These figures should be accepted with reserve because it requires a long period of observation to assess the probable end results of a case of poliomyelitis with certainty.

Age distribution of patients with "moderate" and "severe" paralysis.—By definition "moderate" meant "likely to need a period of treatment in an orthopedic hospital but with a good prospect of an ultimate return to normal life." "Severe" meant "unlikely to return to normal life." In all, there were 1,843 survivors in the "moderate" and "severe" classes and their age grouping was as follows:

Age group	Number	Percent	Age group	Number	Percent
Under 1 year	102	5.5	25–34	192	10.3
1–4	586	31.8	35–44	68	3.7
5–14	588	31.9	45 and over	12	.7
15–24	295	16.0			

These are probably the best figures on which to base estimates of the need for long-stay hospital accommodation. If "corrected" notifications for 1947 prove to be about 7,500 and these are regarded as equivalent to the 4,717 "confirmed" cases it may mean that some 40 percent, or 3,000 patients, will need long-stay hospital treatment. About one-third of these are likely to be under 5, one-third between 5 and 15, and one-third over 15, with a preponderance of males over females of about 5 to 4. It is difficult to make an estimate of the number of persons likely to be severely crippled as a result of the epidemic but it seems possible that it may be about 1,000.

TABLE 2.—*Detailed analysis of hospital inquiry*

	Males								Females							
	Under 1 year	1–4	5–14	15–24	25–34	35–44	45 and over	Total	Under 1 year	1–4	5–14	15–24	25–34	35–44	45 and over	Total
Paralytic limbs and/or trunk:																
Slight	19	185	227	81	46	20	5	583	22	131	144	100	62	20	4	483
Moderate	38	224	174	64	56	20	5	581	42	180	168	80	43	20	1	534
Severe	13	97	111	93	69	30	9	422	14	73	121	89	58	14	4	373
Total	70	506	512	238	171	70	19	1,586	78	384	433	269	163	54	9	1,390
Paralytic, other:																
Slight	4	38	63	18	5	4	-----	132	1	21	37	14	5	7	2	87
Moderate	1	18	20	7	4	2	1	53	-----	9	16	6	5	1	-----	37
Severe	2	12	33	24	25	15	4	115	-----	7	15	15	16	6	2	61
Total	7	68	116	49	34	21	5	300	1	37	68	35	26	14	4	185
Nonparalytic:																
With C. S. F. changes	12	97	224	110	48	19	4	514	1	32	93	68	44	15	2	255
Clinical only	1	40	103	31	13	6	2	196	5	24	53	25	13	11	1	132
Total	13	137	327	141	61	25	6	710	6	56	146	93	57	26	3	387
Presumptive	4	28	33	18	4	2	2	91	2	19	23	10	9	4	1	68
Not polio	33	271	456	189	86	64	48	1,147	34	159	320	182	105	57	41	898
FATAL CASES OF POLIOMYELITIS AND POLIOENCEPHALITIS																
Paralytic:																
Limbs and/or trunk	3	9	19	32	23	13	3	102	1	10	16	17	17	9	2	72
Other	4	9	24	23	27	11	6	104	-----	6	11	11	17	7	3	55
Total	7	18	43	55	50	24	9	206	1	16	27	28	34	16	5	127
Nonparalytic	1	4	6	2	-----	-----	2	15	1	2	1	3	4	-----	1	12
Treated in respirator:																
Temporarily	1	14	40	41	24	13	3	136	-----	5	22	25	22	7	-----	81
Permanently	1	4	13	15	13	5	1	52	-----	3	8	11	16	2	1	41
Total	2	18	53	56	37	18	4	188	-----	8	30	36	38	9	1	122

Use of respirators.—In all, 310 patients were treated in respirators (males 188, females 122). 217 were treated temporarily and 93 were likely to need such treatment permanently. The mortality among patients treated in respirators was not ascertained.

Effect of pregnancy.—There were 760 confirmed cases in women of childbearing age (15–44) and of these patients 71 were pregnant, an incidence of 9.3 percent. A rough estimate of the probable incidence of pregnancy in an unselected sample of women of childbearing age based on the number of live and stillbirths in the whole year 1947 divided by the estimated female population (15–44) with an allowance for multiple pregnancies gives an incidence of 9.4 percent. In the sample as a whole, therefore, there does not seem to have been a high incidence of disease in pregnant women. One hospital reported no less than 8 pregnancies among 16 women of childbearing age and it is obvious that such an experience would lead those in charge to believe that pregnancy might be an important predisposing cause of the disease.

CONCLUSIONS

Generally speaking the findings are in accordance with those of other countries of Western civilization. They show the same relatively high age incidence as compared with the relatively low age incidence in countries of more primitive civilization. The greater severity of the disease in higher age groups is another feature which has been reported elsewhere.

QUARANTINE NOTICES

Pakistan

Information has been received that precautions against yellow fever are being strictly enforced in Pakistan. An airplane is permitted to enter that country without quarantine if the plane's log book record covering a 6-month period shows that the plane has not touched at an endemic yellow fever area and no passengers have been received from a yellow fever area while the plane was en route to Pakistan. Otherwise the plane must have a disinsectization certificate issued prior to arrival by recognized authority, and occupants of the plane must have certificates from recognized sources showing that they had been inoculated 15 days before arrival. Persons not complying with these requirements are subject to nine days' quarantine.

THE IMPORTANCE OF COVERAGE IN DDT RESIDUAL HOUSE SPRAYING FOR CONTROL OF *ANOPHELES QUADRIMACULATUS* MOSQUITOES [1]

By R. H. McCauley, *Senior Assistant Sanitarian* (R), R. W. Fay, *Senior Assistant Sanitarian* (R), S. W. Simmons, *Senior Scientist, United States Public Health Service.*

During the summers of 1945 and 1946, the health departments of the Southeastern States, in cooperation with the United States Public Health Service, carried out widespread rural house-spraying operations with DDT for the control of the malaria mosquito, *Anopheles quadrimaculatus*. In this work only the walls and ceilings were treated. Biological evaluations of this type of residual spray coverage has shown it to be effective in killing mosquitoes in dwellings. Daytime resting places of *A. quadrimaculatus* have certain conditions in common. Roughly, such resting spots are limited to dark corners and dark surfaces behind and beneath furniture and such objects as pictures, clothing, etc. If suitable control of *A. quadrimaculatus* could perhaps be obtained by spraying only such preferred resting areas in a room, a considerable saving in time, labor, and materials would be possible in a large operational program.

In conjunction with a study of the effect of such limited residual coverage, consideration has been given to the effects of a method of spray application in which DDT coverage would be complete, that is including the likely resting places in a room in addition to those treated by a regular spray job such as that described above. If such a technique proved significantly better than that already in use, modifications in the present method might prove worthwhile.

The experiments described in this paper were performed during the spring and summer of 1946 to test the comparative effectiveness of DDT as a residual insecticide against *A. quadrimaculatus* when applied in three degrees of completeness of coverage to the surfaces in furnished unoccupied rooms.

PROCEDURE

The investigations were conducted in nine bedrooms of uniform dimensions, in an abandoned portion of a housing project on the outskirts of Savannah, Ga. In order to set up conditions resembling those in a furnished bedroom, these rooms were furnished with nine identical sets of simulated furniture made of cardboard and scrap lumber, and designed to offer resting conditions for *A. quadrimaculatus* mosquitoes similar to those in occupied rooms.

In applying residual spray the three coverage techniques mentioned above were used. In three rooms, spray was applied by the spot technique, i. e., to the undersides of furniture and pictures and the parts of the wall immediately behind them, and to the corners of the room and the angles between the walls and ceilings. In three rooms the furniture was removed during the application of spray which was then applied by the regular technique, that is, to the walls and ceilings. In the final three rooms the complete technique, a combination of the above two methods was used, spray being applied to the walls and ceilings and to the underside and backs of furniture and pictures. Thus, if the complete job is considered to have received 100 percent coverage, the regular job received 89.4 percent and the spot job 45.8 percent coverage.

---

[1] From Communicable Disease Center, Technical Development Division (Savannah, Ga.).

The equipment used for spraying consisted of a 4-gallon-capacity, open-head, air-pressure, hand sprayer equipped with a straight wand and nozzle. The nozzle produced a 50° fan-shaped spray and delivered 0.2 gallons per minute at 40 pounds pressure. A pressure gage was attached to this apparatus for accuracy.

The spray used was a 5-percent-DDT emulsion made by adding six parts of water to one part of 35-percent solution of DDT in xylene containing 4 percent *Triton X–100.*[2] The surface was covered at the rate of 190 square feet per minute in order to obtain a deposit of 200 mg. of DDT per square foot. All spraying was performed by one experienced operator. In rooms in which walls and ceilings were treated, application was timed in relation to the delivery rate of the nozzle at 40 pounds pressure in order that the residue would be deposited as accurately as possible. The spraying of such small surfaces as the undersides of furniture was done at as nearly as possible the same rate as that used in spraying walls.

After spraying, the rooms were further prepared by laying wrapping paper on the floor to facilitate the recovery of knocked down mosquitoes and were then left undisturbed for about 3 weeks in order to be thoroughly dry and to eliminate any possible repellent action due to the effect of xylene or the emulsifier.

After this brief "seasoning" period, tests were begun to measure the comparative knock-down efficiency of the differently treated rooms against mosquitoes. Only insectary-reared mosquitoes were used, both for convenience and in order to preserve the uniformity of the test as much as possible. Since the resistance of *A. quadrimaculatus* to DDT may vary with age, all mosquitoes used were 3 to 4 days old.

In testing, a cage containing approximately 500 *A. quadrimaculatus* mosquitoes was carried into the room and opened to allow the insects to escape. During a release the door of the room was kept closed except to let the operator in and out, and the windows, equipped with screens, were raised.

---

[2] An emulsifier produced by the Rohm & Haas Co. of Philadelphia, Pa.

At intervals of 15 minutes over a period of 4 hours after release, all knocked-down mosquitoes were removed from the room by means of an aspirator. Each of these lots of mosquitoes was enumerated by sex, and records of females only were used in making evaluations. It was found that this method gave an indication of the relative efficiency of the residual applications. After the first series of tests, the time interval between recoveries was extended to 20 minutes to enable one operator to run two tests simultaneously.

At the beginning of this work, knocked-down mosquitoes were held for 24 hours to determine what percentage, if any, recovered after knock-down. It was found that no recovery occurred so that for all practical purposes the knock-down and kill could be considered identical.

As a check on the condition of the mosquitoes during the 4 hours of each test, a small number (20–30) was drawn out of the holding cage before the actual test was started. These were held apart and examined for weak or fallen mosquitoes at intervals during the test period. It was unnecessary to repeat any tests because of weakness of the test insects.

The air temperature and relative humidity in each room was determined and recorded at the beginning and end of each test in order that the effect of any extreme fluctuations in these conditions could be noted. It soon became apparent that the effects of temperature and humidity could not be accurately evaluated in tests of this kind; therefore, these data were not used in this study.

Three series of releases were made at intervals of approximately 3 weeks, 10 weeks, and 16 weeks after spraying.

RESULTS

Table 1 shows the cumulative percentage of female *A. quadrimaculatus* knocked down at the end of each of the 4 hours during which the

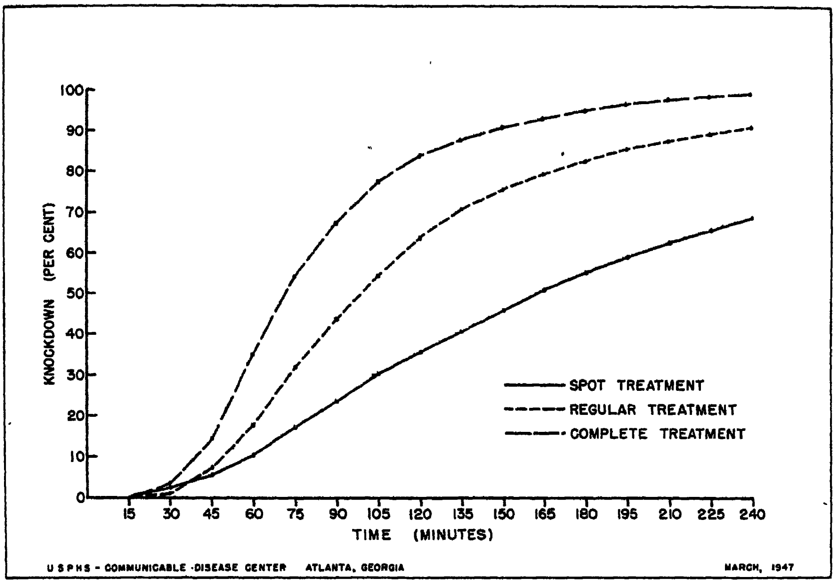
TABLE 1.—*Cumulative percentages of knock-down of adult female* A. quadrimaculatus *mosquitoes at the end of successive 1-hour periods during 4-hour exposures to residual deposits of DDT at 200 mg./$ft.^2$ in furnished rooms with 3 degrees of completeness of coverage; figures are weighted averages of percentage of mosquitoes recovered in 3 similarly treated rooms*

Type of coverage	Spot treatment (45.8 percent coverage)			Regular treatment (89.4 percent coverage)			Complete treatment (100 percent coverage)		
Mean age of residue in days	21	68	112	20	69	114	21	70	114
Percent KD at 1 hour	23.9	3.8	3.6	33.0	10.3	10.4	53.0	29.9	22.6
Percent KD at 2 hours	61.5	26.2	19.9	82.4	54.9	53.9	96.4	83.9	71.4
Percent KD at 3 hours	78.4	50.4	36.6	94.0	76.0	77.2	99.7	94.0	91.2
Percent KD at 4 hours	85.9	63.5	56.8	97.8	85.1	89.4	100	99.2	97.3
Percent remaining alive [1]	13.9	36.4	43.4	1.7	14.8	10.9	0	.5	2.6

test was run. Each percentage is derived from a weighted average of the number of mosquitoes recovered in the three similarly treated rooms at the end of each time interval. Weights were assigned to each room in proportion to the square root of the number of mosquitoes released in each.

It was evident from the earliest tests that the spot treatment was inferior since the average cumulative knock-down of female mosquitoes at the end of 4 hours was only 85.9 percent, failing by more than 10 percent and nearly 15 percent, respectively, to achieve the effects of the regular and complete treatments. Subsequent tests substantiated these results and showed that the differentials increased with the age of the residue. It is readily understandable that other conditions being equal, a room with surfaces only partly covered by a residual insecticide will be less efficient in killing mosquitoes than one with a much greater proportionate area covered, as already noted by Tarzwell and Stierli (*2*). It is perhaps less obvious that the differences between the effectiveness of several degrees of coverage become greater as the deposit ages, since loss of knock-down efficiency occurs more rapidly in rooms with less area covered by DDT. This is clearly shown by the increase in number of minutes necessary to obtain a 50-percent knock-down as the DDT residues increased in age from 3 to 16 weeks. For the spot treatment this increase was 135 minutes, for the regular treatment 95 minutes, and for the complete treatment 40 minutes. The difference in residual effectiveness between the regular and complete treatments was less pronounced than between spot and regular treatments as shown in table 1, but was, nevertheless, definite.

The increase of the difference in effectiveness between the various treatments is apparently caused by the reduction in rapidity of knock-down which occurs with the aging of DDT residues. The percentage of mosquitoes remaining alive, as the action of the DDT residue became slower, was relatively greater in spot treatments, where only 45.8 percent of the available surfaces was sprayed, than in the more complete treatments. When the total untreated surface is large, irritated mosquitoes, even in a freshly treated room, can readily find harmless surfaces before receiving a knock-down or lethal dose of the insecticide. As the DDT ages and its action becomes slower, the exposure time necessary for knock-down increases and the chances that mosquitoes will not be knocked down in 4 hours are greatly enhanced. In rooms treated by the regular method, the untreated areas available to mosquitoes for escape from the irritating DDT residue are much smaller, more difficult for the mosquitoes to find, and when the knock-down rate of the residue is reduced with age, have a correspondingly smaller effect on the reduction of residual knock-down efficiency of rooms so treated. In those rooms treated by the complete method, untreated surfaces available to mosquitoes are at a minimum; therefore, reduction in the rate of knock-down lacks the complicating factor of escape areas which tend to reduce the efficiency of a room as a killing chamber. The cumulative effect of this is illustrated graphically in figure 1 in which each curve is a composite of all knock-down data from each treatment. It follows that residue aging must be well advanced to affect materially the 4-hour knock-down efficiency of a complete treatment.



U S P H S - COMMUNICABLE DISEASE CENTER ATLANTA, GEORGIA MARCH, 1947

FIGURE 1.—Mean differences in effectiveness between 3 degrees of coverage calculated from cumulative percentages of knock-down of adult female *A. quadrimaculatus* mosquitoes at 15-minute intervals during 4-hour exposures to residual deposits of DDT at 200 mg./ft.^{2} in furnished rooms; each curve drawn from combined data of three tests over a 4-month period using figures representing weighted averages of mosquitoes recovered in three similarly treated rooms.

From the standpoint of practical field operations, the spot treatment is not sufficiently effective to warrant general use. The question remains whether the complete treatment is sufficiently superior to the regular treatment to warrant recognition as the most practical method of application. Taking the 4-hour knock-down as a measure of effectiveness, the complete treatment, undisturbed, remains highly effective for at least 4 months.

Operational procedures on the extended malaria control program call for reapplication of a residue of 200 mg. of DDT per square foot after 3 months, using a technique approximating the regular treatment, here described, for all applications. Judging from present tests, the complete treatment is significantly superior to the regular treatment from the standpoints of both immediate knock-down and duration of effectiveness. The question then arises whether the complete treatment is sufficiently more effective to eliminate the need of retreatment after as short a period as 3 months.

In order to develop a standard of comparison, it is necessary to consider the regular treatment in terms of operational spray treatment. In the regular treatment the 4-hour knock-down 3 months after application is 80–90 percent, as measured by these release studies, but is unknown for any operational application. However, spraying has been repeated before the effective toxicity of the previous treatment was considered to have been exhausted (*3*). In other words, the residue was considered satisfactory for a period of at least 3 months. From the experimental standpoint therefore, the knock-down figures "80–90 percent," though not necessarily numerically equivalent to the knock-down obtainable from operationally applied residues of the same age, will serve to indicate what constitutes a satisfactory knock-down in terms of this experiment. If a complete treatment is used, according to the present data, in which better than 90 percent knock-down in 4 hours can be expected experimentally for a period of 4 months, it is reasonable to assume that such a treatment operationally applied would remain suitably effective for at least 4 months. Since a DDT residue does not lose toxicity suddenly, it is probable that a residual spray applied by the complete-treatment method will remain effective for a much longer period.

The data presented here further indicate the importance of efficiency and thoroughness of application entirely apart from the type of coverage intended. The weaknesses of the spot method of treatment will tend to apply to rooms where poor coverage is accidental or due to slovenly application.

The decision between the regular or complete treatment in malaria control operations will depend on conditions prevailing in the area involved. Where funds, equipment, materials, or labor are a limiting factor, use of the regular method will permit more dwellings to receive treatment, with the probability of a greater effect on the general malaria problem than could be expected if fewer homes were sprayed by the complete treatment method. On the other hand, for individuals treating their own homes, or for operations where it is considered necessary to get the best possible control of the greatest number of kinds of insects, the complete treatment will probably be worth the extra effort and expense. Consideration must also be given to the relative need for respraying during a control season. Although additional data are needed the results of the experiments described above suggest that use of the complete treatment may make a second spray application unnecessary in some instances. It is therefore probable that one complete treatment would produce adequate control of *A. quadrimaculatus* at least in areas where the season of mosquito abundance lasts only about 4 months. It is possible that the effect of complete spraying may hold for a longer period, in which case two treatments would be unnecessary, even in areas where the control season is somewhat longer. The relative costs of regular treatment versus complete treatment are not known, although it is obvious that one complete treatment requires less over-all expenditure of funds, manpower, materials, and time than two treatments by the regular method. The implications are that due consideration should be given to the possibility of using complete treatment when plans are made for projected residual spray operations.

SUMMARY AND CONCLUSIONS

Tests made by releasing *Anopheles quadrimaculatus* mosquitoes in rooms in which varying amounts of surface were treated with a residue of DDT at 200 mg. per square foot indicated that (1) satisfactory control of this mosquito cannot be expected from a spot treatment in which only the predictable resting places in a room are sprayed; (2) coverage of the predictable resting places plus the walls and ceilings in a room is a more effective method of application than that in which only the walls and ceilings are sprayed; (3) the amount of total area covered with DDT not only affects the initial knock-down efficiency of the treatment of the room, but the residual quality as well; (4) based on the criterion of 4-hour knock-down, complete treatment is experimentally more effective than the regular treatment; (5) efficient application is necessary for the greatest residual effect of DDT spray.

ACKNOWLEDGMENTS

Gratitude is extended to Mr. W. H. Stillwell and Mr. R. L. Tallton of the Housing Authority of Savannah for their cooperation in making vacant dwellings at Deptford Place available for use in these tests. Acknowledgment is made to Mr. Fred Freeman for his unfailing help with many preparatory and routine aspects of these experiments. Particular thanks are due to Dr. W. M. Upholt for many helpful suggestions, particularly with regard to the analysis of data.

REFERENCES

(*1*) Stierli, H., Simmons, S. W., and Tarzwell, C. M.: Operational procedures and equipment used in the practical application of DDT as a residual house spray. Pub. Health Rep. Supplement No. 186, p. 49–65 (1945).

(*2*) Tarzwell, C. M., and Stierli, H.: The evaluation of DDT residual sprays for the control of anopheline mosquitoes in dwellings. Pub. Health Rep. Supplement No. 186, p. 35–48 (1945).

(*3*) Knowles, F. L., and Smith, C. S.: Duration of toxicity of several DDT residual sprays under conditions of malaria-control operations. Pub. Health Rep. 61: 1806 (1946).

INCIDENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

FEBRUARY 1–28, 1948

The accompanying table summarizes the incidence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in PUBLIC HEALTH REPORTS under the section "Incidence of Diseases." The table gives the number of cases of these diseases for the 4 weeks ended February 28, 1948, the number reported for the corresponding period in 1947, and the median number for the years 1943–47.

DISEASES ABOVE MEDIAN INCIDENCE

Influenza.—For the 4 weeks ended February 28 there were 45,556 cases of influenza reported. Of the total cases, Texas reported 17,201, South Carolina 4,336, California 4,273, Arizona 3,696, Virginia 3,577, Arkansas 2,079, Alabama 2,050, Oregon 1,870, and Washington 1,345 cases—a total of 40,427 cases, which was about 89 percent of the total cases. The high incidence of this disease has been confined to the South Atlantic, South Central, and Far Western sections. In the Pacific section the number of cases was 13.8 times the median; in the South Central and Mountain sections the numbers of cases were more than twice the median and in the South Atlantic section the incidence was 1.3 times the median. Few cases have been reported from the North Atlantic and North Central regions. While the number of reported cases declined only slightly from the preceding 4 weeks, during the last week of the current 4-week period, the incidence fell in practically all of the above-mentioned States.

Measles.—There were 58,759 cases of measles reported for the current 4 weeks as compared with 20,417 in 1947 and a median of 48,914 cases for the corresponding 4 weeks in the 5 preceding years. Most of the current increase was due to an excess of cases in the East North Central and West South Central sections; in the former section the current incidence was more than 3 times the median while in the latter section the number of cases was 2.4 times the median. In each of the other 7 sections the number of cases was about equal to or lower than the seasonal expectancy.

DISEASES BELOW MEDIAN INCIDENCE

Diphtheria.—For the 4 weeks ended February 28 there were 834 cases of diphtheria as compared with a 5-year (1943–47) median of 1,165 cases. The median was represented by the 1947 incidence. In the Mountain section the number of cases (105) was 62 percent above the median and a negligible increase was reported from the

South Atlantic section, but in all other sections the incidence was relatively low. Of the total cases reported from the Mountain section 31 occurred in Arizona and 23 in Colorado.

Meningococcus meningitis.—The incidence of this disease during the current 4 weeks was slightly higher than that in 1947, but the number of cases (354) was only about 34 percent of the 1943–47 median for the corresponding period. In the New England and East South Central sections the numbers of cases were approximately twice the number reported for the same weeks in 1947 and minor increases were reported from the North Central and Pacific sections. The current incidence in each section was, however, below the median for the 5 preceding years.

Poliomyelitis.—The 111 cases of poliomyelitis reported for the 4 weeks ended February 28 was 60 percent of the number reported for the corresponding weeks in 1947 and 78 percent of the 1943–47 median. The Middle Atlantic, South Atlantic, and Mountain sections each reported a few more cases than might normally be expected, but in other sections the incidence was either the same as the median or fell below it. For the country as a whole the current incidence was the lowest since 1944 when 90 cases were reported for this same period.

Scarlet fever.—This disease continued at an unprecedented low level, 9,626 cases being reported for the current 4 weeks as compared with 11,017 in 1947 and a median of 16,265 cases for the corresponding period in the preceding 5 years. The incidence was below the median in all sections of the country with the greatest declines occurring in the North Atlantic sections and the smallest in the South Central sections. For the country as a whole the current incidence was the lowest for this period in the 20 years for which data are available in this form.

Smallpox.—Fourteen cases of smallpox were reported for the 4 weeks ended February 28. During the same weeks in 1947 there were 13 cases reported and the median for the preceding 5 years was 43 cases. Four cases occurred in the East North Central section, five in the West South Central section, and the remaining five cases were widely distributed over the country.

Typhoid and paratyphoid fever.—The number of cases (149) of these diseases was the lowest reported for these same weeks in the 20 years for which these data are available. In the East North Central section the incidence was 1.3 times the median for the 5 preceding years (1943–47), but in all other sections the incidence was below the seasonal expectancy.

Whooping cough.—The incidence of whooping cough (8,556 cases) was about 83 percent of the 1947 incidence for the same period and 91 percent of the median for the 5 preceding years (9,357 cases). The greatest increase over the normal seasonal incidence was reported from the West South Central and Mountain sections and the greatest declines occurred in the North Atlantic sections.

MORTALITY, ALL CAUSES

For the 4 weeks ended February 28 there were 41,179 deaths from all causes reported to the National Office of Vital Statistics by 93 large cities. The median number for the corresponding period in the years 1945–47 was 39,599. The number of deaths was higher than the median for the 3 preceding years in the first 3 weeks of the current period, but during the last week of the period the number of deaths was 4 percent below the 3-year median.

Number of reported cases of 9 communicable diseases in the United States during the 4-week period Feb. 1–28, 1948, the number for the corresponding period in 1947, and the median number of cases reported for the corresponding period, 1943–47

Division	Current period	1947	5-year median	Current period	1947	5-year median	Current period	1947	5-year median
	Diphtheria			Influenza [1]			Measles		
United States	834	1,165	1,165	45,556	15,707	18,933	58,759,	20,417	48,914
New England	27	75	30	17	65	127	2,290	6,036	5,527
Middle Atlantic	82	166	116	48	63	118	12,058	3,444	13,341
East North Central	130	176	160	472	169	477	22,596	3,471	7,455
West North Central	47	97	97	436	228	235	5,310	438	4,196
South Atlantic	166	160	163	8,918	3,893	6,738	3,294	3,376	3,298
East South Central	78	114	106	2,887	503	1,372	1,291	301	2,494
West South Central	129	169	232	20,503	8,484	9,817	6,492	786	2,669
Mountain	105	59	65	4,787	2,147	2,147	1,567	1,661	1,934
Pacific	70	149	156	7,488	155	542	3,861	904	3,874
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	354	322	1,034	111	185	143	9,626	11,017	16,265
New England	23	13	41	2	7	3	702	1,038	2,036
Middle Atlantic	66	83	213	18	19	15	2,433	2,835	3,798
East North Central	45	42	151	9	30	9	3,258	3,391	4,181
West North Central	29	27	70	9	19	12	855	1,027	1,602
South Atlantic	44	44	161	29	26	21	676	742	1,159
East South Central	48	23	107	10	13	13	375	447	596
West South Central	41	43	94	8	17	15	217	236	506
Mountain	7	7	22	11	4	7	374	440	1,008
Pacific	51	40	107	15	50	34	736	861	1,100
	Smallpox			Typhoid and paratyphoid fever			Whooping cough		
United States	14	13	43	149	167	208	8,556	10,259	9,357
New England	0	0	0	9	10	10	711	1,147	1,141
Middle Atlantic	0	0	0	22	23	33	1,235	2,072	1,925
East North Central	4	5	16	31	23	23	1,725	2,597	1,625
West North Central	2	2	4	4	8	8	500	372	385
South Atlantic	1	0	2	34	31	38	1,035	1,219	1,246
East South Central	1	4	4	5	15	21	369	381	381
West South Central	5	1	15	23	29	38	1,643	1,545	1,181
Mountain	1	0	3	7	11	11	789	318	430
Pacific	0	1	1	14	17	17	549	608	608

[1] North Carolina, New York, and Pennsylvania excluded; New York City and Philadelphia included.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED MARCH 6, 1948

Summary

The incidence of influenza declined for the fifth consecutive week, from 9,008 cases last week to 7,429 for the current week, as compared with a 5-year (1943–47) median of 5,249. In 1947 a rise beginning unusually late (week ended February 22) reached a peak of 52,115 cases reported for the week ended March 22. Of the current week's total, 6,689 cases (90 percent) were reported in the 9 States of the South Atlantic, South Central, Mountain and Pacific areas which reported more than 91 cases each. Two of these States (Texas and California) showed a combined increase of 353 cases, while 7 showed a decline of 1,548 cases. Only one State (Wisconsin) outside these areas reported as many as 62 cases. The total for the year to date is 99,620 cases, as compared with 40,591 for the same period last year, a 5-year median of 40,673, and 306,514 in 1944, which was the largest number reported for a corresponding period of the past 5 years.

Of 22 cases of poliomyelitis reported (last week 20, 5-year median 26), Idaho reported 6 (past 3 weeks 1). No other State reported more than 2 cases. The total for the year to date is 292, as compared with 539 for the same period last year and a 5-year median of 340.

Four cases of small pox were reported—2 in Kansas, and 1 each in Minnesota and Georgia. New York reported 1 case of psittacosis, and New York and New Jersey each 1 case of anthrax. Figures for the year to date above the respective median expectancies have been reported for the dysenteries (combined), infectious encephalitis, influenza, measles, Rocky Mountain spotted fever, and undulant fever.

Deaths recorded during the week in 93 large cities of the United States totaled 9,788, as compared with 9,765 last week, 10,206 and 9,885, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 9,885. The total for the year to date (10 weeks through March 6) is 103,504, as compared with 100,149 for the corresponding period last year. The number of infant deaths for the week in the same cities was 671, as compared with 600 last week and a 3-year median of 607. The total to date 7,087, as compared with 8,233 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended March 6, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47
	Mar. 6, 1948	Mar. 1, 1947		Mar. 6, 1948	Mar. 1, 1947		Mar. 6, 1948	Mar. 1, 1947		Mar. 6, 1948	Mar. 1, 1947	
NEW ENGLAND												
Maine	1	1	1	------	3	1	1	201	10	0	1	4
New Hampshire	0	0	0	------	------	------	------	19	------	1	0	1
Vermont	0	0	0	4	------	------	5	150	114	2	0	0
Massachusetts	6	14	6	------	------	------	837	450	450	0	1	8
Rhode Island	0	0	0	------	------	1	1	150	27	0	0	4
Connecticut	0	0	0	5	1	3	40	457	259	1	0	3
MIDDLE ATLANTIC												
New York	12	13	13	[1] 24	[1] 7	[1] 8	1,803	257	2,040	4	10	34
New Jersey	2	17	3	9	15	15	1,332	222	1,259	3	2	13
Pennsylvania	6	10	10	(3)	[2] 4	[2] 4	980	480	976	7	10	24
EAST NORTH CENTRAL												
Ohio	5	8	8	5	3	8	1,155	509	292	2	4	11
Indiana	16	17	12	14	137	40	557	43	320	0	0	4
Illinois	2	8	13	2	6	8	2,677	64	835	4	5	20
Michigan [3]	7	7	7	2	1	2	1,657	68	68	1	3	8
Wisconsin	1	0	0	62	11	59	724	255	729	2	3	4
WEST NORTH CENTRAL												
Minnesota	7	8	7	4	------	1	292	53	53	1	3	3
Iowa	1	5	4	13	------	------	669	94	94	0	1	1
Missouri	1	1	4	10	90	7	186	8	387	3	2	7
North Dakota	2	0	0	------	12	12	24	6	6	0	0	1
South Dakota	0	3	1	------	------	------	20	8	68	0	1	0
Nebraska	1	0	2	19	15	15	96	20	56	2	0	0
Kansas	5	7	7	3	325	9	27	10	428	1	0	2
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	35	2	20	0	0	1
Maryland [3]	7	6	9	2	2	12	78	20	59	1	1	6
District of Columbia	0	0	0	------	2	2	159	9	113	0	1	1
Virginia	9	5	5	724	491	595	112	547	547	4	1	10
West Virginia	1	2	2	82	52	38	223	80	42	2	0	2
North Carolina	8	11	11	------	------	------	10	257	257	0	0	8
South Carolina	9	2	2	804	628	705	55	75	75	4	0	4
Georgia	2	4	4	43	454	115	119	229	224	2	0	4
Florida	5	4	2	4	1	3	132	6	47	3	2	7
EAST SOUTH CENTRAL												
Kentucky	6	7	5	1	14	35	21	286	286	6	8	8
Tennessee	3	7	5	81	33	43	187	164	242	3	3	7
Alabama	8	9	8	205	130	198	92	69	69	2	3	4
Mississippi [3]	3	10	10	91	------	------	67	------	------	1	1	5
WEST SOUTH CENTRAL												
Arkansas	4	5	5	249	376	174	228	130	90	1	1	3
Louisiana	4	10	2	55	54	54	4	27	27	2	6	6
Oklahoma	2	10	10	137	62	198	38	4	34	3	0	1
Texas	13	22	35	3,283	3,636	1,634	1,824	286	472	4	9	9
MOUNTAIN												
Montana	2	1	1	32	20	20	71	188	162	0	0	0
Idaho	11	1	1	13	10	------	53	5	86	0	0	0
Wyoming	0	4	0	------	31	9	71	7	12	0	1	1
Colorado	1	8	6	60	1,212	67	329	81	275	1	0	1
New Mexico	2	1	1	4	6	6	19	24	12	0	0	0
Arizona	3	1	1	278	71	115	56	40	40	1	2	2
Utah [3]	4	1	0	61	13	60	19	7	124	0	0	0
Nevada	0	0	0	30	------	3	2	------	5	0	0	0
PACIFIC												
Washington	0	1	5	5	13	2	230	37	151	4	2	3
Oregon	1	7	3	240	8	14	45	54	76	3	0	1
California	16	23	23	769	25	77	1,600	230	843	10	8	18
Total	199	281	270	7,429	7,974	5,249	18,962	6,388	18,496	91	95	267
9 weeks	2,012	2,724	2,750	99,620	40,591	40,673	111,135	41,825	93,989	777	762	2,254
Seasonal low week [4]	(27th) July 5-11			(30th) July 26-Aug. 1			(35th) Aug. 30-Sept. 5			(37th) Sept. 13-19		
Total since low	8,370	10,290	11,290	143,178	73,566	73,566	146,081	64,712	120,113	1,559	1,734	4,705

[1] New York City only. [2] Philadelphia only. [3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended March 6, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	Mar. 6, 1948	Mar. 1, 1947		Mar. 6, 1948	Mar. 1, 1947		Mar. 6, 1948	Mar. 1, 1947		Mar. 6, 1948[5]	Mar. 1, 1947	
NEW ENGLAND												
Maine	0	0	0	27	21	37	0	0	0	0	1	1
New Hampshire	0	0	0	0	3	11	0	0	0	0	0	0
Vermont	0	1	0	1	4	8	0	0	0	0	0	0
Massachusetts	0	0	0	127	136	322	0	0	0	1	1	1
Rhode Island	0	0	0	7	12	17	0	0	0	0	0	0
Connecticut	0	1	0	38	38	61	0	0	0	1	0	1
MIDDLE ATLANTIC												
New York	1	1	1	256	422	569	0	0	0	1	1	5
New Jersey	0	0	0	100	132	144	0	0	0	0	1	1
Pennsylvania	0	2	0	326	259	407	0	0	0	1	3	5
EAST NORTH CENTRAL												
Ohio	0	2	1	404	453	453	0	0	0	1	2	0
Indiana	0	0	0	95	129	129	0	0	1	0	4	2
Illinois	0	3	0	167	166	269	0	0	0	2	4	4
Michigan [3]	0	1	0	132	144	166	0	0	0	0	1	1
Wisconsin	0	4	0	63	62	280	0	0	0	1	0	0
WEST NORTH CENTRAL												
Minnesota	2	1	0	42	75	79	1	0	0	0	1	0
Iowa	0	0	0	48	29	71	0	0	1	0	0	0
Missouri	0	1	0	52	46	117	0	0	0	0	4	1
North Dakota	0	0	0	10	5	10	0	0	0	0	1	0
South Dakota	0	0	0	0	9	21	0	0	0	0	0	0
Nebraska	1	0	0	51	49	67	0	0	1	1	0	0
Kansas	0	1	0	25	53	90	2	0	0	1	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	9	8	8	0	0	0	0	0	0
Maryland [3]	0	0	0	33	26	119	0	0	0	0	0	0
District of Columbia	0	0	0	9	13	26	0	0	0	1	0	0
Virginia	1	2	2	30	50	63	0	0	0	2	4	4
West Virginia	0	0	0	20	17	36	0	0	0	1	0	0
North Carolina	2	0	0	21	41	42	0	0	0	1	0	0
South Carolina	1	0	0	16	9	9	0	0	0	0	0	0
Georgia	1	2	0	12	19	17	1	0	0	0	3	3
Florida	0	3	1	12	12	12	0	0	0	4	1	1
EAST SOUTH CENTRAL												
Kentucky	0	0	0	37	37	61	0	0	0	2	0	1
Tennessee	1	1	1	20	60	60	0	1	0	0	1	1
Alabama	2	0	0	8	14	20	0	0	0	0	0	0
Mississippi [3]	2	5	0	6	11	10	0	0	0	2	1	1
WEST SOUTH CENTRAL												
Arkansas	0	1	1	11	11	11	0	0	0	1	0	1
Louisiana	0	0	0	6	11	11	0	0	0	3	8	1
Oklahoma	0	0	0	15	6	27	0	0	0	1	1	0
Texas	0	1	1	43	67	74	0	0	0	4	3	3
MOUNTAIN												
Montana	1	0	0	11	3	11	0	0	0	0	0	0
Idaho	6	0	0	14	15	15	0	0	0	0	0	0
Wyoming	0	2	0	1	20	17	0	0	0	0	0	0
Colorado	0	0	0	20	75	70	0	0	0	1	0	0
New Mexico	0	0	0	4	6	6	0	0	0	0	0	0
Arizona	0	0	0	3	3	13	0	0	0	0	0	0
Utah [3]	0	0	0	24	14	38	0	0	0	0	0	0
Nevada	0	0	0	3	1	1	0	0	0	0	0	0
PACIFIC												
Washington	0	0	1	67	50	50	0	0	0	0	1	0
Oregon	0	2	0	26	38	38	0	0	0	0	0	0
California	1	15	3	100	148	227	0	0	0	3	13	3
Total	22	52	26	2,552	3,032	3,948	4	1	9	36	61	49
9 weeks	292	539	340	20,711	23,737	34,156	29	31	86	342	394	465
Seasonal low week [4]	(11th) Mar. 15–21			(32d) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	[6]10,503	25,336	13,743	43,250	50,423	72,477	50	85	169	3,751	3,922	5,101

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately, as follows: Massachusetts 1 (salmonella infection), Ohio 1, Illinois 1, Wisconsin 1, Virginia 1, North Carolina 1, California 2.

[6] Correction (deducted from cumulative totals): Poliomyelitis, Georgia, week ended Feb. 14, 0 (instead of 1).

Telegraphic morbidity reports from State health officers for the week ended March 6, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended March 6, 1948							
	Week ended—		Median 1943-47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Mar. 6, 1948	Mar. 1, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	19	20	26	------	------	------	------	------	------	------	------
New Hampshire	2	25	1	------	------	------	------	------	------	------	------
Vermont	42	16	35	------	------	------	------	------	------	------	------
Massachusetts	50	90	120	------	1	------	2	------	------	------	1
Rhode Island	1	11	33	------	------	------	------	------	------	------	------
Connecticut	16	62	40	------	------	------	------	------	------	------	4
MIDDLE ATLANTIC											
New York	103	152	168	4	------	------	5	------	------	------	4
New Jersey	48	115	115	------	------	------	------	------	------	------	2
Pennsylvania	82	175	171	1	------	------	------	------	------	------	3
EAST NORTH CENTRAL											
Ohio	81	117	135	------	------	------	------	------	------	------	1
Indiana	31	47	29	------	------	------	3	------	------	------	1
Illinois	45	91	85	3	3	------	2	------	------	------	1
Michigan [3]	67	200	138	3	------	------	------	------	------	------	1
Wisconsin	76	187	81	------	------	------	------	------	------	------	3
WEST NORTH CENTRAL											
Minnesota	14	19	27	1	------	------	------	------	------	------	1
Iowa	18	2	9	------	------	------	------	------	------	------	1
Missouri	49	32	9	------	------	2	------	------	------	------	------
North Dakota	21	1	1	11	------	------	------	------	------	------	------
South Dakota	3	------	------	------	------	------	------	------	------	------	------
Nebraska	12	29	4	------	------	------	------	------	------	------	3
Kansas	39	20	37	------	------	------	------	------	------	------	3
SOUTH ATLANTIC											
Delaware	8	5	5	------	------	------	------	------	------	------	------
Maryland [3]	19	47	38	------	------	1	------	------	------	------	1
District of Columbia	10	2	3	------	------	------	------	------	------	------	------
Virginia	56	105	55	1	------	80	1	------	1	1	1
West Virginia	36	37	40	------	------	------	------	------	------	------	------
North Carolina	66	48	116	2	------	------	------	------	------	------	------
South Carolina	74	22	52	------	2	------	------	------	1	------	1
Georgia	8	67	25	1	------	------	------	------	1	1	1
Florida	12	45	29	2	1	------	------	------	1	1	1
EAST SOUTH CENTRAL											
Kentucky	16	32	32	------	1	------	------	------	------	------	------
Tennessee	47	21	21	------	------	------	------	------	3	------	1
Alabama	25	33	13	------	------	------	------	------	------	2	1
Mississippi [3]	8	------	------	3	1	------	------	------	2	------	1
WEST SOUTH CENTRAL											
Arkansas	76	29	16	18	------	------	------	------	1	------	------
Louisiana	19	19	2	2	------	------	------	------	1	2	1
Oklahoma	17	9	9	1	------	------	------	------	------	------	3
Texas	435	440	215	13	154	87	------	------	------	5	6
MOUNTAIN											
Montana	10	7	6	------	------	------	------	------	1	------	------
Idaho	4	4	4	------	------	------	1	------	------	------	1
Wyoming	3	------	2	------	------	------	1	------	------	------	------
Colorado	63	7	28	1	------	------	------	------	------	------	3
New Mexico	28	18	17	------	------	------	------	------	------	------	------
Arizona	49	17	17	------	------	11	------	------	------	------	------
Utah [3]	30	6	17	------	------	------	------	------	------	------	5
Nevada	------	------	------	------	------	------	------	------	------	------	------
PACIFIC											
Washington	40	48	46	------	------	------	------	------	------	------	8
Oregon	20	13	13	------	5	------	------	------	------	------	3
California	144	132	132	4	1	------	------	------	------	------	2
Total	2,142	2,624	2,393	71	169	181	15	0	12	12	69
Same week: 1947	2,624	------	------	41	245	219	10	2	24	37	173
Median, 1943-47	2,393	------	------	34	245	89	10	0	12	32	[7] 85
9 weeks: 1948	20,136	------	------	531	2,404	2,124	80	5	186	136	770
1947	22,393	------	------	401	3,228	1,844	62	6	390	422	921
Median, 1943-47	20,816	------	------	244	2,623	1,018	66	3	189	460	[7] 760

[3] Period ended earlier than Saturday.

[7] 3-year median 1945-47.

WEEKLY REPORTS FROM CITIES[1]

City reports for week ended February 28, 1948

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	1	2	0	3	0	3	0	0	4
New Hampshire:												
Concord	0	0	------	0	------	0	1	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	5	0	------	2	373	0	8	0	45	0	0	9
Fall River	0	0	------	0	1	0	0	0	1	0	0	------
Springfield	0	0	------	0	2	0	0	0	2	0	0	------
Worcester	0	0	------	0	------	0	7	0	6	0	0	1
Rhode Island:												
Providence	0	0	1	1	3	0	3	0	7	0	0	------
Connecticut:												
Bridgeport	0	0	1	0	1	0	0	0	3	0	1	------
Hartford	0	0	------	0	------	0	0	0	1	0	0	3
New Haven	0	0	------	0	------	0	2	0	3	0	0	4
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	3	0	9	0	10	0	0	7
New York	4	0	13	0	1,064	1	86	2	83	0	2	33
Rochester	0	0	------	0	1	0	3	0	9	0	0	------
Syracuse	0	0	------	0	12	1	1	0	13	0	0	6
New Jersey:												
Camden	0	0	------	0	2	0	4	0	2	0	0	3
Newark	0	0	------	0	70	0	5	0	14	0	0	5
Trenton	0	0	------	0	3	0	1	0	2	0	0	------
Pennsylvania:												
Philadelphia	1	0	3	2	214	5	19	0	44	0	0	31
Pittsburgh	1	0	------	0	------	1	13	0	26	0	0	12
Reading	0	0	------	0	4	0	3	0	9	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	50	0	6	0	11	0	0	2
Cleveland	0	0	2	0	1	1	6	0	44	0	0	18
Columbus	0	0	1	1	217	1	1	0	10	0	0	7
Indiana:												
Fort Wayne	0	0	------	0	15	0	1	0	6	0	0	------
Indianapolis	1	0	3	1	194	1	7	0	10	0	0	14
South Bend	0	0	------	0	2	0	0	0	1	0	1	2
Terre Haute	0	0	------	0	22	0	1	0	0	0	0	1
Illinois:												
Chicago	1	0	------	0	854	2	35	0	54	0	1	18
Springfield	0	0	------	0	110	0	2	0	0	0	0	------
Michigan:												
Detroit	5	0	------	0	109	0	14	0	75	0	0	22
Flint	0	0	------	0	1	0	0	0	3	0	0	------
Grand Rapids	0	0	------	0	398	0	3	0	3	0	0	3
Wisconsin:												
Kenosha	0	0	------	0	89	0	0	0	0	0	0	------
Milwaukee	0	0	------	0	25	0	4	0	20	0	0	9
Racine	0	0	------	0	157	0	1	0	2	0	0	1
Superior	0	0	------	0	16	0	0	0	1	0	0	3
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	5	0	2	0	2	0	0	1
Minneapolis	3	0	------	1	127	1	7	0	8	0	0	------
St. Paul	2	0	------	0	28	1	3	0	3	0	0	1
Missouri:												
Kansas City	0	0	5	1	11	0	7	0	3	0	0	8
St. Joseph	0	0	------	0	------	0	0	0	2	0	0	------
St. Louis	4	0	------	0	110	1	4	0	16	0	0	6

[1] In some instances the figures include nonresident cases.

City reports for week ended Feb. 28, 1948—Continued

Division State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	3	0	2	0	2	0	0	------
Nebraska:												
Omaha	0	0	------	0	31	0	2	0	5	0	0	1
Kansas:												
Topeka	0	0	------	0	1	0	0	0	0	0	0	------
Wichita	0	0	------	0	6	0	0	0	3	0	0	1
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	16	0	4	0	1	0	0	------
Maryland:												
Baltimore	3	0	3	3	11	0	4	0	14	0	0	12
Cumberland	1	0	------	0	------	0	1	0	1	0	0	1
Frederick	2	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	1	0	------	0	194	0	7	0	11	0	1	10
Virginia:												
Richmond	1	0	------	1	------	0	3	0	6	0	0	5
Roanoke	0	0	------	0	------	0	0	0	0	0	0	------
West Virginia:												
Charleston	0	0	------	0	10	0	7	0	1	0	0	------
Wheeling	0	0	------	0	2	0	1	0	1	0	0	3
North Carolina:												
Raleigh	0	0	------	0	------	0	0	0	1	0	0	------
Wilmington	2	0	------	0	------	0	1	0	0	0	0	5
Winston-Salem	0	0	------	0	1	0	2	0	1	0	0	2
South Carolina:												
Charleston	0	0	115	0	2	0	0	0	0	0	0	3
Georgia:												
Atlanta	0	0	------	0	1	0	3	0	4	0	0	2
Brunswick	0	0	------	0	1	0	0	0	0	0	0	------
Savannah	1	0	4	0	------	0	0	0	1	0	0	1
Florida:												
Tampa	0	0	3	0	38	0	4	2	1	0	0	6
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	2	0	108	3	9	0	2	0	0	10
Nashville	0	0	------	1	------	0	7	0	1	0	0	------
Alabama:												
Birmingham	0	0	1	1	------	0	3	0	3	0	0	2
Mobile	0	0	48	1	------	0	4	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	3	1	3	0	2	0	0	0	0	2
Louisiana:												
New Orleans	2	0	24	6	------	2	46	0	3	0	0	3
Shreveport	0	0	------	0	------	0	1	0	1	0	0	------
Oklahoma:												
Oklahoma City	0	0	------	0	------	0	2	0	0	0	0	------
Texas:												
Dallas	1	0	------	0	19	1	6	0	2	0	0	1
Galveston	0	0	------	0	------	0	2	0	0	0	0	------
Houston	0	0	4	0	38	0	7	0	2	0	0	------
San Antonio	1	0	------	0	4	0	5	0	0	0	0	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	1	0	2	0	1	0	0	2
Great Falls	0	0	------	0	1	0	1	0	0	0	0	------
Helena	0	0	------	0	------	0	0	0	0	0	0	------
Missoula	0	0	------	0	7	0	0	0	0	0	0	------
Idaho:												
Boise	0	0	------	0	------	0	3	0	0	0	0	------
Colorado:												
Denver	1	0	4	0	145	0	1	0	2	0	0	28
Pueblo	0	0	------	0	8	0	4	0	1	0	0	13
Utah:												
Salt Lake City	0	0	------	0	9	1	1	0	7	0	0	------

City reports for week ended February 28, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	6	0	5	0	13	0	0	7
Spokane	0	0	2	0	------	0	1	0	1	0	0	-----
Tacoma	0	0	------	0	43	0	0	0	3	0	0	------
California:												
Los Angeles	22	0	28	0	99	0	7	0	17	0	0	11
San Francisco	1	0	18	1	265	0	11	0	8	0	0	2
Total	66	0	288	25	5,369	23	443	4	677	0	6	369
Corresponding week, 1947[1]	81	------	147	15	1,371	------	397	------	739	0	2	716
Average 1943-47[1]	72	------	203	[2] 31	[3] 4,575	------	[2] 438	------	1,454	1	9	625

[1] Exclusive of Oklahoma City. [2] 3-year average 1945-47. [3] 5-year median 1943-47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (latest available estimated population, 34,474,000)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	13.1	0.0	5.2	10.5	999	0.0	62.7	0.0	186	0.0	2.6	55
Middle Atlantic	2.8	0.0	7.4	0.9	635	3.7	66.6	0.9	98	0.0	0.9	45
East North Central	4.3	0.0	3.6	1.2	1,374	3.0	49.3	0.0	146	0.0	1.2	61
West North Central	17.9	0.0	9.9	4.0	641	6.0	53.7	0.0	88	0.0	0.0	36
South Atlantic	18.2	0.0	206.9	6.6	457	0.0	61.2	3.3	71	0.0	1.7	83
East South Central	0.0	0.0	301.0	17.7	637	17.7	135.7	0.0	35	0.0	0.0	71
West South Central	10.2	0.0	78.7	17.8	163	7.6	180.3	0.0	20	0.0	0.0	18
Mountain	7.9	0.0	31.8	0.0	1,358	7.9	95.3	0.0	87	0.0	0.0	342
Pacific	37.7	0.0	78.7	1.6	677	.00	39.4	0.0	69	0.0	0.0	33
Total	10.0	0.0	43.7	3.8	814	3.5	67.2	0.6	103	0.0	0.9	56

Dysentery, amebic.—Cases: New York 7, Chicago 1, Washington 1, Los Angeles 4.
Dysentery, bacillary.—Cases: New York 2, Los Angeles 1.
Dysentery, unspecified.—Cases: San Antonio 1.
Leprosy.—Cases: Los Angeles 1.
Typhus fever, endemic.—Cases: New Orleans 1.

DEATHS DURING WEEK ENDED FEBRUARY 28, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Feb. 28, 1948	Corresponding week 1947
Data for 93 large cities of the United States:		
Total deaths	9,765	10,165
Median for 3 prior years	10,165	------------
Total deaths, first 9 weeks of year	93,716	89,943
Deaths under 1 year of age	600	796
Median for 3 prior years	689	------------
Deaths under 1 year of age, first 9 weeks of year	6,416	7,377
Data from industrial insurance companies:		
Policies in force	66,855,124	67,327,514
Number of death claims	10,707	13,999
Death claims per 1,000 policies in force, annual rate	8.4	10.8
Death claims per 1,000 policies, first 9 weeks of year, annual rate	10.0	9.8

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended February 14, 1948.—During the week ended February 14, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		46		185	381	74	25	57	93	861
Diphtheria				5	5			3	4	17
Dysentery:										
Amebic					1					1
Bacillary					2					2
German measles				15	27	1		14	4	61
Influenza		67			20				22	109
Measles		3	1	870	1, 422	26	13	12	65	2, 412
Meningitis, meningococcus					2					2
Mumps		21	4	166	257	40	38	41	10	577
Poliomyelitis						1	1			2
Scarlet fever		3		42	59	1		9	10	124
Tuberculosis (all forms)		8	5	66	48	37		27		191
Typhoid and paratyphoid fever				7	1					8
Undulant fever				3	1				1	5
Venereal diseases:										
Gonorrhea		10	9	106	66	38	34	32	60	355
Syphilis	1	13	7	83	42	13	14	9	29	211
Other forms									1	1
Whooping cough		2		38	13	7	3	63	18	144

NEW ZEALAND

Notifiable diseases—4 weeks ended January 31, 1948.—During the 4 weeks ended January 31, 1948, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	8		Poliomyelitis	60	4
Diphtheria	27	1	Puerperal fever	11	
Dysentery:			Scarlet fever	45	
Amebic	1		Tetanus	2	
Bacillary	7		Trachoma	3	
Erysipelas	17		Tuberculosis (all forms)	204	48
Food poisoning	9		Typhoid fever	15	
Malaria	1		Undulant fever	5	
Ophthalmia neonatorum	2				

SMALLPOX VACCINATION REQUIREMENT IN VENEZUELA

Information has been received that an outbreak of variola minor has been reported in Puerto la Cruz, and that a special smallpox vaccination requirement has been imposed as follows for persons going to Puerto la Cruz and Guanta:

Shore leave passengers and crew members of vessels calling at those localities should have vaccination certificates issued within last 6 months.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From consular reports, international health organizations, medical officers of the Public Health Service, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January–December 1947	January 1948	February 1948—week ended—			
				7	14	21	28
AFRICA							
Egypt	C	21,920	1	-------	-------	-------	-------
Alexandria	C	253	-------	-------	-------	-------	-------
Cairo	C	133	1	-------	-------	-------	-------
Ismailiya	C	99	-------	-------	-------	-------	-------
Port Said	C	37	-------	-------	-------	-------	-------
Suez	C	26	-------	-------	-------	-------	-------
ASIA							
Arabia: Amirate of Dubay	C	1	-------	-------	-------	-------	-------
Burma	C	263	-------	1	-------	-------	-------
Moulmein	C	66	-------	-------	-------	-------	-------
Rangoon	C	4	-------	-------	-------	-------	-------
China:							
Anhwei Province	C	6	-------	-------	-------	-------	-------
Chekiang Province	C	288	-------	-------	-------	-------	-------
Pingyang	C	150	-------	-------	-------	-------	-------
Wenchow	C	1	-------	-------	-------	-------	-------
Formosa (Island of)	C	14	-------	-------	-------	-------	-------
Fukien Province	C	16	-------	-------	-------	-------	-------
Foochow	C	2	-------	-------	-------	-------	-------
Honan Province	C	936	-------	-------	-------	-------	-------
Hunan Province	C	16	-------	-------	-------	-------	-------
Kiangsi Province	C	102	-------	-------	-------	-------	-------
Kiangsu Province	C	738	-------	-------	-------	-------	-------
Chinkiang	C	8	-------	-------	-------	-------	-------
Shanghai	C	53	-------	-------	-------	-------	-------
Tsingkiang	C	9	-------	-------	-------	-------	-------
Kwangtung Province	C	6	-------	-------	-------	-------	-------
Hong Kong	C	6	-------	-------	-------	-------	-------
Suiyuan Province	C	52	-------	-------	-------	-------	-------
Szechwan Province	C	5	-------	-------	-------	-------	-------
India	C	151,248	10,865	-------	-------	-------	-------
Ahmadabad	C	27	-------	-------	-------	-------	-------
Allahabad	C	70	-------	-------	-------	-------	-------
Bombay	C	114	-------	-------	-------	-------	-------
Calcutta	C	4,716	571	186	199	174	-------
Cawnpore	C	332	-------	-------	-------	-------	-------
Chittagong (See also Pakistan)	C	32	-------	-------	-------	-------	-------
Lahore	C	2,173	-------	-------	-------	-------	-------
Lucknow	C	288	-------	-------	-------	-------	-------
Madras	C	27	2	1	-------	1	-------
Nagpur	C	38	-------	-------	-------	-------	-------
New Delhi	C	35	-------	-------	-------	-------	-------
India (French):							
Chandernagor	C	33	-------	-------	-------	-------	-------
Karikal	C	15	-------	-------	-------	-------	-------
Pondicherry	C	37	-------	-------	-------	-------	-------
India (Portuguese)	C	51	-------	-------	-------	-------	-------
Indochina (French):							
Annam	C	37	-------	-------	-------	-------	-------
Cambodia	C	1,173	290	-------	[1] 47	-------	-------
Cochinchina	C	541	24	-------	[1] 9	-------	-------
Bien Hoa	C	7	-------	-------	-------	-------	-------
Chaudoc	C	5	1	-------	-------	-------	-------
Cholon	C	33	1	-------	-------	-------	-------
Giadinh	C	11	-------	-------	-------	-------	-------
Longxuyen	C	36	-------	-------	-------	-------	-------
Mytho	C	6	-------	-------	4	-------	-------
Rachgia	C	22	6	-------	5	-------	-------
Saigon	C	136	9	-------	-------	-------	-------
Vinh-long	C	8	-------	-------	-------	-------	-------
Laos	C	55	-------	-------	-------	-------	-------
Tonkin	C	67	-------	-------	-------	-------	-------

See footnotes at end of table.

CHOLERA—Continued

Place		January—December 1947	January 1948	February 1948—week ended—			
				7	14	21	28
ASIA—continued							
Pakistan	C		2,540				
Chittagong	C		3				
Siam (Thailand)	C	3.451	10	8	1		
Bangkok	C	781					
Straits Settlements: Penang	C	[2] 1					
Syria	C	45	3				

[1] For the period Feb. 1-10, 1948.
[2] Imported.

PLAGUE

[C indicates cases; D, deaths]

Place		January—December 1947	January 1948	February 1948—week ended—			
				7	14	21	28
AFRICA							
Belgian Congo	C	[1] 21	2				
British East Africa:							
Kenya	C	60	5				
Tanganyika	C		1			1	
Uganda	C	1					
Egypt: Alexandria	C	24					
Madagascar	C	[2] 276	61				
Mananjary	C	8					
Rhodesia, Northern	C				5		
Union of South Africa	C	[3] 42	[4] 17	9		2	
ASIA							
Burma	C	1,362	167	42	21	26	
Bassein	C	[5] 2					
Mandalay	C	17					
Rangoon	C	19	3	1	3	2	
China:							
Chekiang Province	C	150					
Formosa (Island of)	C	1					
Fukien Province	C	779	5				
Amoy	C	13					
Foochow	C	49					
Kiangsi Province	C	405	8				
Nanchang	C	46					
Kiangsu Province	C	30					
Shanghai	C	28					
Kwangtung Province	C	164					
Yunnan Province	C	[6] 780					
India	C	75,647	3,153				
Indochina (French):							
Annam	C	89	61		[7] 24		
Cambodia	C	1					
Cochinchina	C	31			[7] 7		
Laos State	C	2					
Java	C	39	3			1	
Korea	C	22					
Manchuria	D	[8] 100					
Palestine	C	43					
Siam (Thailand)	C	67	54	16	7		
Syria	C	6					
Turkey: Akcakale	C	19					
EUROPE							
Germany: East Prussia.[9]							
Portugal: Azores	C	4	4				
Turkey (see Turkey in Asia).							
NORTH AMERICA							
Canada.[10]							
SOUTH AMERICA							
Argentina:							
Buenos Aires Province	C		3				
Cordoba Province	C	1					
Santa Fe Province	C	3					
Brazil:[11]							
Alagoas State	C	1					
Ceara State	C	2					
Minas Geraes State	C	7					
Parahyba State	C	4					
Pernambuco State	C	9					

See footnotes at end of table.

PLAGUE—Continued

Place		January—December 1947	January 1948	February 1948—week ended—			
				7	14	21	28
SOUTH AMERICA—continued							
Ecuador:							
Chimborazo Province	C	5					
Loja Province	C	22	1				
Peru:							
Ancash Department	C	1					
Lambayeque Department	C	11					
Libertad Department	C	20					
Lima Department	C	56	1				
Piura Department	C	[12] 79					
OCEANIA							
Hawaii Territory: Plague-infected rats [13]		3	[14] 6		3		

---

[1] Includes 5 cases of pneumonic plague.
[2] Includes 64 cases of pneumonic plague.
[3] Includes 4 cases of pneumonic plague.
[4] Includes 2 cases of pneumonic plague.
[5] Imported.
[6] Includes 12 cases of pneumonic plague.
[7] For the period Feb. 1-10, 1948.
[8] Period not specified.
[9] During the month of June 1947, an outbreak of plague with high mortality occurred in Königsberg, East Prussia, Germany.
[10] For the period July 5 to Sept. 20, 1947, 6 lots of plague-infected fleas from squirrels were reported in Alberta and Saskatchewan Provinces, Canada.
[11] In addition, 7 cases of plague were reported in Brazil for the period Jan. 1 to May 31, 1947, specific localities not being given.
[12] In addition 82 cases with 65 deaths in Ayabaca Province and 58 cases with 48 deaths in Huancabamba Province, all unconfirmed, were reported for the period September 1946 to March 1947.
[13] Plague infection was also reported in Hawaii Territory as follows: On Jan. 9, 1947, in a pool of 31 rats, on Mar. 20, 1947, in a pool of 32 fleas collected from 59 rats; under date of Feb. 27, 1948, in a mass inoculation of tissue from 19 rats.
[14] Includes 1 mouse.

SMALLPOX

[C indicates cases; P, present]

AFRICA							
Algeria	C	287					
Angola	C	265					
Basutoland	C	1	1				
Bechuanaland	C	38					
Belgian Congo	C	[1] 2,573	[1] 132			25	
British East Africa:							
Kenya	C	471	13	3			
Nyasaland	C	2,100	238				
Tanganyika	C	2,806	71				
Uganda	C	614	53	1			
Cameroon (French)	C	139					
Dahomey	C	161	45			[2] 14	
Egypt	C	496					
Ethiopia	C	32					
French Equatorial Africa	C	12	4				
French Guinea	C	427			[3] 48		
French West Africa: Haute-Volta	C		106				
Gambia	C	6	9				
Gold Coast	C	969	129				
Ivory Coast	C	2,913	99		[3] 17		
Liberia	C	37					
Libya	C	2,297	32	2	10		
Mauritania	C	23					
Morocco (French)	C	61	1		[3] 4		
Morocco (Int. Zone)	C	12					
Morocco (Spanish)	C	30					
Mozambique	C	28	14				
Nigeria	C	5,238					
Niger Territory	C	2,685	97				
Portuguese Guinea	C	3					
Rhodesia:							
Northern	C	171	59	21	22		
Southern	C	557					

See footnotes at end of table.

SMALLPOX—Continued

Place		January—December 1947	January 1948	February 1948—week ended—			
				7	14	21	28
AFRICA—continued							
Senegal	C	17	-------	-------	-------	-------	-------
Sierra Leone	C	422	26	-------	-------	-------	-------
Sudan (Anglo-Egyptian)	C	940	181	22	16	-------	-------
Sudan (French)	C	395	2	-------	-------	-------	-------
Swaziland	C	11	-------	-------	-------	-------	-------
Togo (French)	C	88	3	-------	[3] 9	-------	-------
Tunisia	C	1,192	-------	-------	-------	-------	-------
Union of South Africa	C	538	-------	P	-------	-------	-------
ASIA							
Arabia	C	1	-------	-------	-------	-------	1
Burma	C	2,880	249	92	95	86	-------
Ceylon	C	1	-------	-------	-------	-------	-------
China	C	3,394	472	131	137	98	-------
India	C	53,800	8,541	-------	-------	-------	-------
India (French)	C	10	-------	-------	-------	-------	-------
India (Portuguese)	C	12	-------	-------	-------	-------	-------
Indochina (French)	C	4,905	570	-------	[2] 150	-------	-------
Iran	C	408	111	-------	-------	-------	-------
Iraq	C	67	19	24	36	-------	-------
Japan	C	391	1	-------	-------	-------	-------
Korea	C	125	-------	-------	-------	-------	-------
Lebanon	C	22	46	4	-------	-------	-------
Malay States (Federated)	C	4,160	215	-------	20	-------	-------
Manchuria	C	8	-------	-------	-------	-------	-------
Netherlands East Indies	C	4	-------	-------	-------	-------	-------
Pakistan	C	-------	2,221	190	-------	-------	-------
Palestine	C	-------	7	-------	-------	1	-------
Portuguese Timor	C	32	-------	-------	-------	-------	-------
Siam (Thailand)	C	1,369	150	70	31	-------	-------
Straits Settlements	C	99	-------	-------	-------	-------	-------
Syria	C	27	15	-------	-------	-------	-------
Turkey (see Turkey in Europe).							
EUROPE							
Belgium	C	[1] 23	-------	-------	-------	-------	-------
France	C	48	-------	-------	-------	-------	-------
Germany	C	12	-------	-------	-------	-------	-------
Great Britain: England and Wales	C	77	-------	-------	-------	-------	-------
Greece	C	10	-------	-------	-------	-------	-------
Irish Free State	C	[4] 1	-------	-------	-------	-------	-------
Italy	C	68	-------	-------	-------	-------	-------
Luxemburg	C	[1] 2	-------	-------	-------	-------	-------
Portugal	C	216	18	-------	7	-------	-------
Spain	C	32	14	-------	-------	-------	-------
Switzerland	C	[4] 1	-------	-------	-------	-------	-------
Turkey	C	3	-------	-------	-------	-------	-------
NORTH AMERICA							
Guatemala	C	12	1	-------	-------	-------	-------
Honduras	C	2	-------	-------	-------	-------	-------
Mexico	C	1,072	-------	-------	-------	-------	-------
Panama (Republic)	C	[4] 1	-------	-------	-------	-------	-------
SOUTH AMERICA							
Argentina	C	38	-------	-------	-------	-------	-------
Brazil	C	488	-------	-------	-------	-------	-------
Colombia	C	3,989	484	32	66	52	-------
Ecuador	C	[1] 3,003	[1] 721	-------	-------	-------	-------
Paraguay	C	[1] 1,478	[1] 41	-------	-------	-------	-------
Peru	C	422	-------	-------	-------	-------	-------
Uruguay	C	[1] 319	-------	-------	-------	-------	-------
Venezuela	C	[1] 5,365	[1] 460	-------	[1] 112	-------	[1] 41

[1] Includes alastrim.
[2] For the period Feb. 1-20, 1948.
[3] For the period Feb. 1-10, 1948.
[4] Imported.

TYPHUS FEVER*

[C indicates cases; P, present]

Place		January—December 1947	January 1948	February 1948—week ended—			
				7	14	21	28
AFRICA							
Algeria	C	257	--------	--------	--------	--------	--------
Basutoland	C	15	1	--------	--------	--------	--------
Bechuanaland	C	1	--------	--------	--------	--------	--------
Belgian Congo	C	382	13	--------	--------	--------	--------
British East Africa:							
Kenya [1]	C	32	9	--------	--------	--------	--------
Uganda	C	2	--------	--------	--------	--------	--------
Egypt	C	138	10	--------	1	--------	--------
Eritrea	C	747	4	--------	--------	--------	--------
Ethiopia	C	360	--------	--------	--------	--------	--------
French West Africa [2]	C	2	--------	--------	--------	--------	--------
Gold Coast	C	6	--------	--------	--------	--------	--------
Libya	C	329	20	12	--------	--------	--------
Morocco (French)	C	128	5	--------	[3] 5	--------	--------
Morocco (International Zone)	C	27	--------	--------	--------	--------	--------
Morocco (Spanish)	C	88	--------	--------	--------	--------	--------
Nigeria [1]	C	18	1	--------	--------	--------	--------
Rhodesia:							
Northern	C	1	--------	--------	--------	--------	--------
Southern	C	1	--------	--------	--------	--------	--------
Senegal	C	2	--------	--------	--------	--------	--------
Sierra Leone	C	3	--------	--------	--------	--------	--------
Sudan (Anglo-Egyptian)	C	1	--------	--------	--------	--------	--------
Tunisia [1]	C	694	--------	--------	--------	--------	--------
Union of South Africa [1]	C	443	P	P	P	--------	--------
ASIA							
Arabia [1]	C	2	--------	--------	--------	--------	--------
Burma	C	3	--------	--------	--------	--------	--------
Ceylon	C	4	--------	--------	--------	--------	--------
China [1, 4]	C	105	11	--------	--------	--------	--------
India	C	8	--------	--------	--------	--------	--------
Indochina (French)	C	79	1	--------	--------	1	--------
Iran	C	263	9	--------	--------	--------	--------
Iraq	C	305	17	1	1	7	--------
Japan	C	1,115	96	--------	16	--------	--------
Java	C	1	--------	--------	--------	--------	--------
Korea	C	1,261	--------	--------	--------	--------	--------
Malay States (Federated) [1]	C	50	--------	--------	--------	--------	--------
Manchuria	C	12	5	--------	--------	--------	--------
Palestine [1]	C	229	--------	--------	--------	--------	--------
Siam (Thailand)	C	4	--------	--------	--------	--------	--------
Straits Settlements [1]	C	11	--------	1	--------	--------	--------
Syria [1]	C	33	1	1	--------	--------	--------
Trans-Jordan	C	20	8	1	--------	--------	--------
Turkey (see Turkey in Europe)							
EUROPE							
Austria [1]	C	8	--------	--------	--------	--------	--------
Bulgaria	C	879	61	--------	--------	--------	--------
Czechoslovakia	C	44	--------	--------	--------	--------	--------
France	C	4	--------	--------	--------	--------	--------
Germany	C	27	1	--------	--------	--------	--------
Great Britain: Malta and Gozo [2]	C	25	3	--------	--------	--------	--------
Greece [1]	C	396	23	2	1	3	--------
Hungary	C	607	18	--------	--------	--------	--------
Italy	C	76	1	--------	--------	--------	--------
Sicily	C	39	--------	--------	--------	--------	--------
Luxemburg	C	5	6	--------	2	2	--------
Netherlands [1]	C	3	--------	1	--------	--------	--------
Norway [2]	C	1	--------	--------	--------	--------	--------
Poland	C	542	22	--------	--------	--------	--------
Portugal	C	4	--------	--------	--------	--------	--------
Rumania [1]	C	28,158	--------	--------	--------	--------	--------
Spain	C	188	--------	--------	--------	--------	--------
Switzerland [2]	C	6	--------	--------	--------	--------	--------
Turkey	C	658	63	12	11	8	--------
Yugoslavia	C	215	45	--------	--------	--------	--------

See footnotes at end of table.

TYPHUS FEVER—Continued

Place		January—December 1947	January 1948	February 1948—week ended—			
				7	14	21	28
NORTH AMERICA							
Costa Rica [2]	C	102	1				
Cuba [2]	C	11	2				
Guatemala	C	322	18				
Jamaica [2]	C	42	2				
Mexico	C	2,009	46	12	7		
Nicaragua	C	2					
Panama Canal Zone	C	15	1				
Panama (Republic)	C	[5] 22					
Puerto Rico [2]	C	57	3				
Virgin Islands [2]	C	2					
SOUTH AMERICA							
Argentina [1]	C	18					
Brazil	C	67	30	8	8	7	
Chile [1]	C	538	8	1	1		
Colombia	C	2,354	261				
Curacao [2]	C	1	4				
Ecuador [1]	C	606	41	1	8		
Peru	C	1,397					
Venezuela [1]	C	193	5		5	1	
OCEANIA							
Australia [2]	C	172	4	6	5		
Hawaii Territory [2]	C	46					

*Reports from some areas are probably murine type, while others probably include both murine and louse borne types.

[1] Includes murine type.

[2] Murine type.

[3] For the period Feb. 1-10, 1948.

[4] Information dated December 10, 1947, stated that 100 deaths from typhus fever daily had occurred in Sinkiang Province, China, and spreading in Tihwa.

[5] Includes imported cases.

YELLOW FEVER

[C indicates cases; D, deaths]

AFRICA							
Belgian Congo: Orientale Province [1]	C	1					
Nigeria: Ossiomo leper settlement	C	[2] 1					
Sudan (French): Bamako	C	3					
SOUTH AMERICA							
Brazil:							
Bahia State	D	1					
Para State	D	1					
Colombia:							
Antioquia Department	C	[3] 8	[3] 2				
Boyaca Department	D	4					
Caldas Department	D	9	2				
Cundinamarca Department	D	2	4				
Intendencia of Meta	D	10	3				
North Santander Department	D	1					
Santander Department	D	29					
Tolima Department	D	3					
Peru: Huanuco Department	D	3					

---

[1] The case of yellow fever in Orientale Province, Belgian Congo, reported on p. 232 of the PUBLIC HEALTH REPORTS for Feb. 13, 1948, and also on p. 296 of the PUBLIC HEALTH REPORTS for Feb. 27, 1948, in the column for week ended Jan. 17, has not been confirmed.

[2] Suspected.

[3] Includes deaths used as cases.

X

HEALTH PROGRAM SPECIALIST

The United States Civil Service Commission has announced an examination for filling positions as Health Program Specialists in the Public Health Service, in Washington, D. C., and throughout the United States at salaries from $3,397 to $7,102 a year. No written test is required for this examination.

To qualify for positions paying up to $4,149 a year, one must have had 3 or 4 years' experience, depending upon the salary, in one or a combination of the following: Program analysis and survey, teaching graduate courses in public health administration or preventive medicine, and operating a health program or project. For the higher paying positions, applicants must have had 5 years experience of which at least 1 year must have been in operating a health program or project, and the remainder must have been in a combination of program planning, program analysis and survey, and negotiating, or in such a combination plus teaching as described above. College education may be substituted for part of the required experience. The positions to be filled involve considerable travel and frequent change of station, and applicants must be willing and able to accept assignment in any part of the United States at any time.

Age limits for Health Program Specialist positions paying $3,397 are 18 to 45 years, and for other Health Program Specialist positions, from 18 to 62 years.

Further information and application forms may be secured at most first- and second-class post offices, from civil service regional offices, and from the United States Civil Service Commission, Washington 25, D. C. Applications must be received in the Commission's Washington office not later than April 1, 1948.

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948

For sale by the Superintendent of Documents, United States Government Printing Office Washington 25, D. C.

Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 APRIL 2, 1948 NUMBER 14

TUBERCULOSIS CONTROL ISSUE NO. 26

IN THIS ISSUE

Editorial—Tuberculosis and the Negro

Studies of Sanatorium Discharges—I.

Economic and Social Problems in Tuberculosis

Absorption of Fatty Acid by Tubercle Bacilli

U.S. PUBLIC HEALTH SERVICE
1798

FEDERAL SECURITY AGENCY
OSCAR R. EWING, *Administrator*
PUBLIC HEALTH SERVICE
THOMAS PARRAN, *Surgeon General*
DIVISION OF PUBLIC HEALTH METHODS
G. ST. J. PERROTT, *Chief of Division*

CONTENTS

Page
Editorial—Tuberculosis and the Negro. Francis J. Weber 425
Studies of patients discharged from tuberculosis sanatoria. Agnes W. Brewster and Ralph Carr Fletcher 427
Some economic and emotional problems of the tuberculosis patient and his family. Sophia Bloom 448
Absorption of bacteriostatic quantities of fatty acid from media by large inocula of tubercle bacilli. Bernard D. Davis 455

INCIDENCE OF DISEASE

United States:

Reports from States for week ended March 13, 1948, and comparison with former years 460
Weekly reports from cities:
City reports for week ended March 6, 1948 464
Rates, by geographic divisions, for a group of selected cities 466
Deaths during week ended March 6, 1948 466

Foreign reports:

Canada—Provinces—Communicable diseases—Week ended February 21, 1948 467
Jamaica—Notifiable diseases—4 weeks ended February 28, 1948 467
Switzerland—Notifiable diseases—October—December 1947 468
Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—
Smallpox 468
Typhus fever 468

Public Health Reports

Vol. 63 ● APRIL 2, 1948 ● *No. 14**

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

EDITORIAL

TUBERCULOSIS AND THE NEGRO

With the observance of the thirty-fourth annual Negro Health Week, April 4 to 11, it is appropriate that we turn our attention to the problem of tuberculosis among Negro citizens of this Nation. Great advances have been made in tuberculosis control among Negroes since the first Negro Health Week in 1914. Tuberculosis control workers as well as the Negro people of this country have reason for pride in past accomplishment and for great expectations of the future, for the trend of tuberculosis mortality in the Negro is indeed heartening.

In 1945, for the first time in history, Negro tuberculosis deaths fell below 100 per 100,000 population, to a new rate of 98.0. This is especially meaningful when we realize that 30 years ago the death rate was perhaps four times as great. Encouraging as this trend is, however, we should be guilty of complacency were we satisfied with present tuberculosis control measures among the Negro people. For it is still true that Negroes, who comprise but 10 percent of the total population, suffer 25 percent of all tuberculosis deaths.

This disproportion is further emphasized by a comparison of Negro and white tuberculosis mortality rates—98.0 for Negroes against 32.7 for white persons. In the 15–44 age group, the Negro tuberculosis mortality rate is about five times that of the white. Among Negroes, too, tuberculosis is in fourth place as a cause of death, preceded only by heart disease, intracranial lesions of vascular origin, and nephritis. When we consider that 13,000 Negroes die of tuberculosis annually, and that we today possess the medical and scientific tools to prevent most tuberculosis deaths, we know that these deaths need not be.

---

* This is the twenty-sixth of a series of special issues of PUBLIC HEALTH REPORTS devoted exclusively to tuberculosis control, which will appear the first week of each month. The series began with the Mar 1, 1946 issue. The articles in these special issues are reprinted as extracts from the PUBLIC HEALTH REPORTS. Effective with the July 5, 1946 issue, these extracts may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 10 cents a single copy. Subscriptions are obtainable at $1.00 per year; $1.25 foreign.

It is true that epidemiology has not as yet resolved the perplexing lack of correlation between tuberculosis morbidity and mortality in the Negro. Community radiographic case-finding surveys reveal that the prevalence of the disease among Negroes is essentially the same as among whites. However, when the infection does take hold, it is far more likely to run a rapidly fatal course in the Negro than in the white person. At best, we can conclude that this indicates a lesser degree of tolerance to the ravages of the disease, whatever the cause.

What, then, can be done to control tuberculosis more effectively among Negroes? An elementary principle of disease control is the intensification of control measures in those areas where the hazards are greatest. The course of tuberculosis in the Negro is rapid and deadly. Early case finding is therefore urgent because among Negro victims of tuberculosis the stage of infectiousness is probably reached quite rapidly. Moreover, facilities for isolation and treatment, now grossly inadequate to care for the needs of the Negro population, must be greatly augmented. In addition, we should consider the employment of a resistance-building measure such as BCG, once its value as an immunizing agent has been clearly established.

Tuberculosis control is an indivisible process, and it is axiomatic that improvement in one area contributes materially to total progress. If we can succeed in reducing the Negro death rate to a level equalling white mortality, we shall have improved the national rate by more than 20 percent. The expenditure now of but little additional effort toward the mitigation of tuberculosis among Negroes must therefore result ultimately in a much higher national level of health and vitality.

Francis J. Weber, *Medical Director,*
Chief, Tuberculosis Control Division.

STUDIES OF PATIENTS DISCHARGED FROM TUBERCULOSIS SANATORIA[1]

I. A Method of Collecting Basic Data From Central Record Systems

By AGNES W. BREWSTER, *Biometrician, United States Public Health Service, and* RALPH CARR FLETCHER, *Associate Professor of Social Work, University of Michigan and Special Consultant, Tuberculosis Control Division, United States Public Health Service.*

Many tuberculosis authorities (*1, 2, 3, 4*) have pointed out the need for studying survivals and readmissions among patients discharged from sanatoria. However, the number of such studies is small in spite of such recommendations as those made by Hilleboe over 10 years ago. He said, "By applying the easily mastered technique of life table analysis to sanatorium follow-up records, and with proper regard for the variables involved, a useful mass of statistics would become available for research in the problems associated with tuberculosis. The application of these methods could be extended to studies of morbidity, the effects of special treatments, socio-economic factors, and a multitude of other fundamental questions concerning tuberculosis which remain largely unanswered."

The greatest single obstacle to a larger volume of research has been the difficulty of following patients after their discharge from sanatoria. After hospitalization, public health officials frequently lose contact with patients so that when follow-up is attempted many must be classified "untraced." The reasons for losing sight of patients are legion. An enumeration of a few shows that patients move from one health jurisdiction to another; female patients marry and change their names; and some patients deliberately disappear because they wish to forget that they ever had tuberculosis.

The difficulties of obtaining data do not end when the whereabouts of the patient have been determined. There are many problems connected with interviewing patients after they are located. Competent interviewers are scarce and because of their specialized training their salaries are frequently beyond the reach of many official agencies. Furthermore, the results of interviewing, even with skilled interviewers, are often inaccurate because of the patient's vague recollections of his experience, or because of erroneous reports from the family of a deceased patient. Earlier studies have relied upon mailing questionnaires to the last-known address and upon follow-up visits by field personnel. Coverage by this expensive technique, however, is frequently incomplete. The number of untraced patients ranges from 10 percent (*2*) to more than 25 percent (*5*) in some of the studies examined.

---

[1] From the Office of Field Studies, Tuberculosis Control Division.

During the past 20 years, progress has been made in the keeping of official State records relating to the health and welfare of individuals. These files have been developed for a variety of administrative purposes, including fiscal and control problems. Therefore the question can be raised as to whether it is possible to rely upon available central records to furnish the basis for research about patients discharged from sanatoria. Can as high a coverage be obtained from the central files of a State as that secured by employing the individual follow-up techniques? Are the data obtained from central files as accurate as those obtained by interviewing? Can the files be used for studies repeated at intervals, and will such repeated studies contain comparable data? The present study was undertaken to answer these questions.

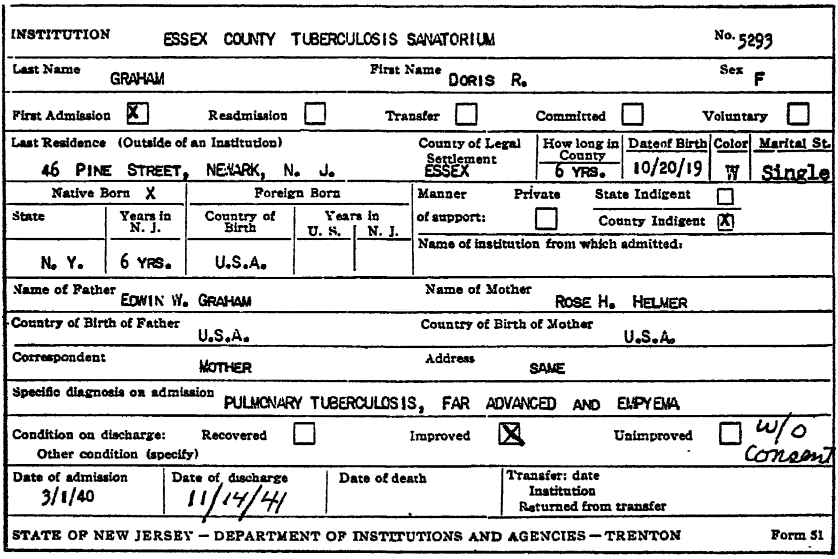
This series of papers, the first of which is here presented, attempts to solve the problem of accumulating a sufficient body of data to permit the drawing of sound conclusions about patients discharged from sanatoria. This first paper is devoted to a study of methods of collecting data, and describes a simple and accurate means of obtaining the information required for studies of survival and readmission rates. The second paper will demonstrate how the data can be used for the determination of mortality and survival rates by such factors as age, race, sex, marital status, stage of disease on admission and condition on discharge, manner of discharge, and length of stay. The third, which will deal with readmission rates, is likewise a demonstration of the application to tuberculosis control problems of data covering many more classifications than age, race, and sex. It will be particularly pertinent to considerations involved in planning for the total care of patients, by showing what types of patients fail to secure sufficient benefit from their first period of sanatorium care to preclude further hospitalization. The fourth paper will be devoted to an analysis of the types of patients who leave sanatoria against medical advice, and will examine the effects of this type of discharge upon subsequent survival and readmission. It should be of interest to professional personnel concerned with assisting the patient in obtaining the maximum benefit from his first period of sanatorium care.

DEVELOPMENT OF THE METHOD

The first step in developing the proposed method was the selection of a State record system which met certain predetermined criteria. The system should contain the records of all persons discharged from sanatoria over a period of at least 5 years. In addition, records must include such items as adequate identification of the patient, dates of admission and discharge, and notations that records refer to first admission or readmission. Finally, they should indicate whether the patient was alive or dead upon discharge.

The New Jersey State Department of Institutions and Agencies has maintained centralized files for over 50 years. Since 1928 their record system has met the stated criteria. Furthermore, the Tuberculosis Control Division of the State Department of Health and the Research and Statistical Division of the State Department of Institutions and Agencies were interested in testing the accuracy and utility of their records.

The central file in Trenton contains separate cards (fig. 1), filed alphabetically, for each stay of every patient in any of the 12 county sanatoria, in the State sanatorium, and in some of those privately operated. It contains the same type of card for all admissions to other State institutions and to general hospitals with tuberculosis services.



INSTITUTION ESSEX COUNTY TUBERCULOSIS SANATORIUM No. 5293

Last Name GRAHAM First Name DORIS R. Sex F

First Admission ☒ Readmission ☐ Transfer ☐ Committed ☐ Voluntary ☐

Last Residence (Outside of an Institution)	County of Legal Settlement	How long in County	Date of Birth	Color	Marital St.
46 PINE STREET, NEWARK, N. J.	ESSEX	6 YRS.	10/20/19	W	Single

Native Born X		Foreign Born		
State	Years in N. J.	Country of Birth	Years in U. S.	Years in N. J.
N. Y.	6 YRS.	U.S.A.		

Manner of support: Private ☐ State Indigent ☐ County Indigent ☒

Name of institution from which admitted:

Name of Father EDWIN W. GRAHAM Name of Mother ROSE H. HELMER

Country of Birth of Father U.S.A. Country of Birth of Mother U.S.A.

Correspondent MOTHER Address SAME

Specific diagnosis on admission PULMONARY TUBERCULOSIS, FAR ADVANCED AND EMPYEMA

Condition on discharge: Recovered ☐ Improved ☒ Unimproved ☐ w/o Consent

Other condition (specify)

Date of admission	Date of discharge	Date of death	Transfer: date Institution Returned from transfer
3/1/40	11/14/41		

STATE OF NEW JERSEY — DEPARTMENT OF INSTITUTIONS AND AGENCIES — TRENTON Form 51

FIGURE 1.

For the purposes of this study a follow-up of the patients discharged during a single year seemed sufficient. A list of the names and case numbers of all patients discharged *alive* from July 1, 1941, to June 30, 1942, was prepared, utilizing the monthly discharge lists of the 13 public sanatoria. All records for persons whose names appeared on the list were drawn from the central file, and a complete record of all stays was made. In cases where patients died in sanatoria, in other State institutions or in general hospitals with tuberculosis services, dates of death were also obtained and noted.

The records of the State Bureau of Vital Statistics were searched for death certificates of all persons on the list except those who were known to be in a sanatorium on January 1, 1947, or those whose death had been recorded in the central files. If a death certificate was located, the date, place, and cause of death were combined with information obtained from the cards in the central file. This search also provided information about deaths which occurred outside the State and which were allocated to New Jersey.

This procedure provided a fairly complete record of the mortality and readmissions to sanatoria of all patients discharged during the base year, 1941–42, from the date of discharge to January 1, 1947. Since the critical period of adjustment of the patient, as reflected in mortality and readmission rates, is within the first few years after discharge, the 5-year span was deemed adequate.

Homogeneity of the group was obtained by selecting only adults with pulmonary tuberculosis. Individuals less than 17 years of age at the time of their admission and those diagnosed as nontuberculous as well as those with a diagnosis of nonpulmonary tuberculosis were excluded. Those who died during their *first* sanatorium stay were also excluded because emphasis was to be placed on the problem of follow-up. This selective process reduced the number of persons on the list to 1678.

The group was further limited to those cases whose *first* period of sanatorium care ended between July 1, 1941, and June 30, 1942. This limitation was made because it was felt that the inclusion of othe patients might introduce bias into the findings. When readmitted, patients are usually in more advanced stages of the disease; they are drawn from groups which might vary greatly in respect to age, race, sex, and stage of disease on admission; some have previously had surgery; and their attitudes toward acceptance of sanatorium treatment have been affected by their previous experience. This restriction eliminated 424 additional names, leaving 1,254 patients in the group.

EVALUATION OF THE METHOD

It was realized that the collected data might contain certain errors due to careless searching, misspelling or misfiling of record cards, and failure to record name changes for females married during the 5-year period studied. In order to estimate the magnitude and to determine the source of these errors a check was made utilizing the records of all female patients. The records of females were selected for this purpose for two reasons: (a) errors resulting from changes in name through marriage could thus be measured; and (b) filing and searching errors discovered among the female group could be considered to apply to all records. The data on the whole group of 1,678 cases were coded as they were collected and were later placed on punch cards so that all tables were prepared by machine sort. The cards included an alphabetical punching of the names of the patients. To prepare lists of female patients who had stayed at each of the sanatoria included in the study and to give the dates of their admissions and discharges, the appropriate cards were machine tabulated.

Each sanatorium was furnished the information previously collected about dates of admission and discharge of all female patients who had stayed at the particular institution during the period under review. The sanatorium was asked to check for accuracy and omissions, and to report all name changes.

The number of errors found in this check of female patients' records was negligible. Records of 742 stays for the 585 females included in the list had been obtained from the central file. Seventeen additional stays were reported by the sanatoria, so that the actual number of stays for the group was 759. Eleven of the stays which were missed in the original search were due to changes of name through marriage; only six could be attributed to failure to locate cards in the central file.

As a result of this check, revisions were made in the original data to correct all the errors discovered in the records of female patients. It is probable that a small error, equivalent to the six missed stays for the females, exists among the male cases; some of these, however, were actually eliminated by a subsequent check.

If records similar to those available in New Jersey are used in future studies, and if the same level of efficiency is maintained in the searching process, such checks as just described would appear to be unnecessary in view of the negligible quantity of clerical errors which could be expected. The precision of future studies will be substantially improved, however, if all marriages of discharged female patients can be recorded and the cards cross-referenced by both maiden and married names. State Central Record Systems if established as outlined in the manual prepared by the Tuberculosis Control Division of the United States Public Health Service (*6*) would provide a consolidated source of all of the information needed to compute survival and readmission tables and considerably simplify the task of collecting the data.

Only 23 of the persons on the original list had been admitted at one time or another to any of the private sanatoria which report to the New Jersey Department of Institutions and Agencies. The number of errors affecting the readmission rates due to failure to note other private sanatorium stays was not determined. With 2,761 public beds and 236 private beds reported in New Jersey in 1940 (*7*), it is obvious that readmissions to private sanatoria would have little effect on the total readmission rates.

The effect on the whole study group of the check may be summarized in the following manner:

Number of persons	Prior to check	After check
With one stay	929	896
With more than one stay	325	352
Total	1,254	1,248

For the purpose of comparing the method of using central files with that employing the interview, as well as to determine the composition of the untraced population, another procedure was undertaken. The comparison was made primarily to determine the errors in enumeration of stays and the errors in recording deaths. A random sample of the white patients was selected by choosing one of every four persons not known to be dead by January 1, 1947. Because of the small size of the nonwhite group, all of them (80 survivors out of 138 discharges) were added to the random sample of the white group, yielding a total of 293 people.

A questionnaire was prepared which was designed to reveal the status of a case as of January 1, 1947 and the patient's complete record of sanatorium care. The New Jersey Department of Health agreed to supervise individual follow-up of these cases, using public health nurses, tuberculosis association personnel, and other local interviewers. These interviewers were asked to obtain from the persons in the selected group their own statements concerning periods of sanatorium treatment, as well as current status. When the person could not be located, information as to his death, or his moving out of the county was obtained from neighbors or local officials. The interviewers were asked to give special attention to reported moves to other States or counties. The follow-up was continued whenever a person was reported to have moved either to another part of New Jersey or out of the State. In cases where deaths were reported the registry of vital statistics was rechecked to determine whether the death certificates had been overlooked through carelessness. A summary of the results of this procedure follows:

	Total	White	Nonwhite
Untraced	37	23	14
Reported to be dead:			
Certificates located	7	4	3
Certificates not located	11	1	10
Total reported dead	18	5	13
Alive, whereabouts known	238	185	53
Total	293	213	80

The interview method was both costly and time-consuming, and did not prove as reliable as the central files in furnishing data about the patient's sanatorium history. It required more time for the interviewers to follow up a group one-fifth as large as the group for which clerks obtained the data from the central files. Dates for entering and leaving sanatoria were frequently in error, and the patients failed to report all of their stays. The sample disclosed three previous admissions hitherto unrecorded which reduced the number of first admissions from 1,248 to 1,245. Additional information on sanatorium stays increased the number of first admissions later readmitted from 352 to 354 of the 1,245 cases.

Corrections were also made for the 18 deaths which were not located in the central files. This number could have been reduced by more uniform allocation of deaths occurring out of the State to the place of residence.

The second part of this procedure is concerned with a description of the characteristics of the 37 untraced persons. There were 23 untraced white persons in the sample of 213, and 14 untraced persons in the whole nonwhite group of 80 persons. If the sample of one-fourth of the whites is representative of the entire group of discharges, approximately 92 of the 852 living white cases were lost during the 5-year period. This, added to the 14 untraced nonwhite cases gives an estimated 106 cases out of the 1,248, or 8.5 percent whose whereabouts were unknown on January 1, 1947.

With regard to location, 22 of the 37 cases unaccounted for in the sample study were reported to have moved out of the State, and the place of residence of the remaining 15 was unknown. Although the 37 cases were untraced as of January 1, 1947, many of them had recorded readmissions or were known to be alive and residing in the State at some time during the 5 years of the study.

If there is a relationship between any determinable characteristic and the disappearance of patients after discharge, the mortality and readmission rates will reflect a bias due to this relationship. However, if the composition of the untraced population is similar to that of the traced persons the effect of the omission of the untraced from the calculations will result only in a general understatement of the rates in proportion to their number. An estimate of the possible bias which the omission of data about death and readmission for the untraced cases may impose upon the study can be made by comparing the composition of the entire group with that of the untraced cases. Table 1 compares the composition of the estimated 106 untraced cases with the composition of the total cases studied (1,248). The differences are not large, indicating that there will be little bias resulting from errors attributable to the lack of knowledge about the survival of the untraced cases. Some of the differences would seem to indicate that mortality among the untraced cases is less than for the cases whose history could be traced throughout the entire 5-year period.

Through these procedures the accuracy of the data for determining survival and readmission rates was ascertained. With respect to admissions, the data obtained from the central file were shown to be more reliable than those secured through interview; moreover, they were believed to contain a smaller percentage of untraced cases than had hitherto been true of other studies. Enough was known

TABLE 1.—*Comparison of the number and percent of persons in the study group with the estimated untraced group by selected characteristics*

	Number of cases		Percentage distribution	
	Untraced (estimated) as of Jan. 1, 1947	Total study group	Untraced	Total
Sex:				
Total	106	[1] 1,248	100.0	100.0
Male	46	678	43.4	54.3
Female	60	570	56.6	45.7
Race:				
Total	106	1,248	100.0	100.0
White	92	1,110	86.8	88.9
Nonwhite	14	138	13.2	11.1
Age:				
Total	106	1,248	100.0	100.0
17–19 years of age	5	83	4.7	6.6
20–29	47	454	44.3	36.4
30–39	36	288	34.0	23.1
40–49	14	206	13.2	16.5
50 and over	4	217	3.8	17.4
Stage of disease:				
Total	106	1,248	100.0	100.0
Minimal	11	183	10.4	14.7
Moderately advanced	41	497	38.7	39.8
Far advanced	54	568	50.9	45.5
Marital status:				
Total	106	1,248	100.0	100.0
Single	54	502	50.9	40.2
Married	37	630	34.9	50.5
Other	15	116	14.2	9.3
Manner of discharge:				
Total	106	1,248	100.0	100.0
With consent	59	729	55.7	58.4
Against advice	47	519	44.3	41.6
Length of stay on first admission:				
Total	106	1,248	100.0	100.0
0–2 months	21	248	19.8	19.9
3–5	18	202	17.0	16.2
6–11	15	341	14.2	27.3
12 months and over	52	457	49.0	36.6
Condition on discharge:				
Total	106	1,248	100.0	100.0
Arrested	16	141	15.1	11.3
Apparently arrested	30	230	28.3	18.4
Quiescent	14	180	13.2	14.4
Improved	32	428	30.2	34.5
Unimproved	14	269	13.2	21.4

[1] This figure represents the number of first admissions discharged before corrections were made from information obtained in the sample study.

about the composition of the untraced group so that the lack of follow-up information would not bias the analysis and conclusions. Unless the information concerning the composition of the untraced group can be secured from State Central Case Records, studies of this type made in the future should repeat this part of the procedure by individual follow-up, either on a sample basis or for the entire group of cases. This step may only be necessary, however, until enough studies have been made to confirm the conclusion that the untraced are not significantly different from the entire study group. By recording all contacts with patients, State Central Case Records will ultimately obviate the necessity of using interviews to discover the untraced cases.

The central file method of follow-up is feasible, since a majority of States have been operating, or are beginning to operate some form of central case record system; for a number of years, too, several States have had systems resembling that used by New Jersey. Such registers, if maintained according to approved standards (*6*), comprise an excellent source of follow-up information.

DESCRIPTION OF THE POPULATION

The material to be presented and discussed in this section is limited to a description of the population. To avoid unnecessary repetition, the tables herein presented will not be included in the subsequent papers where more detailed analyses will be made. In addition to the intrinsic value of these descriptive data, they demonstrate the variety of information concerning discharged patients which can be collected from a central record system.

TABLE 2.—*Number and percent of persons in the study group by age, sex, and race*

Age groups	Both sexes	Males			Females		
		Total	Total white	Total nonwhite	Total	Total white	Total nonwhite
Total	1,245	677	613	64	568	496	72
17-19	83	29	28	1	54	48	6
20-29	452	174	160	14	278	238	40
30-39	288	168	144	24	120	106	14
40-49	206	139	127	12	67	59	8
50 and over	216	167	154	13	49	45	4
Median age	32	37	37	45	27	27	26.5
	Percent						
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
17-19	6.7	4.3	4.6	1.6	9.5	9.7	8.3
20-29	36.3	25.7	26.0	21.9	49.0	48.0	55.6
30-39	23.1	24.8	23.5	37.5	21.1	21.4	19.4
40-49	16.5	20.4	20.7	18.7	11.8	11.9	11.1
50 and over	17.4	24.8	25.2	20.3	8.6	9.0	5.6

Age, sex, and race.—Table 2 shows the distribution by age, sex, and race of the 1,245 cases selected for study. The sex ratio for all ages and all races is 119 males per 100 females. For the white population, it is 124 males per 100 females, which is significantly different from the ratio of 89 males per 100 females found in the nonwhite population. The knowledge of differences such as these can be of value in planning programs of case finding, sanatorium care, and rehabilitation.

The 136 nonwhite cases comprise 11 percent of the group whereas, according to the 1940 census, 5.5 percent of New Jersey's population was nonwhite.

The difference between the age distribution of the 1,245 cases by sex and that of the State population as a whole reflects, in part, the known age-group prevalence of tuberculosis, assuming death rates to be a measure of prevalence. The proportion of females aged 20–29 was double the proportion of this age group in the State in the 1940 census. For females between the ages of 30 and 39, the proportion in the study was identical with that reported in the census; and in the other age groups the proportions in the study were less than in the census. Among males, with high mortality rates spread over a greater span of years, there were larger proportions in the three age groups 20–29, 30–39, and 40–49 than in the corresponding ages in the general population.

TABLE 3.—*Number and percent of persons in the study group by marital status, sex, and race*

	Number in each marital category			
	Total	Single	Married	Other[1]
Both sexes, all races	1,245	502	627	116
White	1,109	458	562	89
Nonwhite	136	44	65	27
Males, all races	677	252	367	58
White	613	233	334	46
Nonwhite	64	19	33	12
Females, all races	568	250	260	58
White	496	225	228	43
Nonwhite	72	25	32	15

	Percent			
	Total	Single	Married	Other[1]
Both sexes, all races	100.0	40.3	50.4	9.3
White	100.0	41.3	50.7	8.0
Nonwhite	100.0	32.3	47.8	19.9
Males, all races	100.0	37.2	54.2	8.6
White	100.0	38.0	54.5	7.5
Nonwhite	100.0	29.7	51.5	18.8
Females, all races	100.0	44.0	45.8	10.2
White	100.0	45.3	46.0	8.7
Nonwhite	100.0	34.7	44.5	20.8

[1] "Other" includes divorced, widowed, and separated.

The median age of the males in the study was 37 years, and of the females, 27. The median ages of the white males and white females were the same as for each sex in the all races group; however, the median age of the nonwhite males was 45 and of the nonwhite females, 26.5 years. It appears that females both enter the sanatorium for the first time and are discharged at a much younger age than the males. There were 61 males per 100 females under 30 years of age, and 201 males per 100 females over 30 years of age. It follows that the rehabilitation of the tuberculous male patient will present problems quite different from those to be considered in planning rehabilitation for the female patient.

Marital status.—At the time of their first admission to the sanatorium, 54 percent of the men were married. This is shown in table 3, where the distribution of persons in the study is given by marital status, race and sex. In view of the large proportion of men who are married, it is evident that more than half of the male cases were likely to have heavy economic responsibilities. The attitude of these patients toward accepting sanatorium care until discharged with consent is undoubtedly affected by their responsibilities and a program for their rehabilitation must take account of this economic factor.

Despite the relatively high age of the men upon admission, the number of single males is nevertheless large. The expectancy of marriage for this group is probably low and their problems of rehabilitation will remain those typical of single, unattached individuals. The smaller proportion of married women is associated with the lower median age of females upon admission.

TABLE 4.—*Number and percent of persons in the study group by marital status, age, sex, and race*

Age groups	Males						Females					
	Single		Married		Other[1]		Single		Married		Other[1]	
	White	Nonwhite	White	Nonwhite	White	Nonwhite	White	Nonwhite	White	Nonwhite	White	Nonwhite
Total	233	19	334	33	46	12	225	25	228	32	43	15
17-19	28	1	------	------	------	------	46	5	2	------	------	1
20-29	130	9	30	3	------	2	135	15	94	21	9	4
30-39	47	7	91	12	6	5	31	4	61	8	14	2
40-49	16	1	99	10	12	1	9	1	44	2	6	5
50 and over	12	1	114	8	28	4	4	------	27	1	14	3
	Percent											
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
17-19	12.0	5.3	------	------	------	------	20.4	20.0	0.9	------	------	6.7
20-29	55.8	47.3	9.0	9.1	------	16.7	60.0	60.0	41.2	65.6	21.0	26 7
30-39	20.2	36.8	27.3	36.4	13.0	41.7	13.8	16.0	26.8	25.0	32.5	13.3
40-49	6.9	5.3	29.6	30.3	26.1	8.3	4.0	4.0	19.3	6.3	14.0	33.3
50 and over	5.1	5.3	34.1	24.2	60.9	33.3	1.8	------	11.8	3.1	32.5	20.0

"Other" includes divorced, , widowed and separated.

The youthfulness and predominantly maiden status of the females, demonstrated in table 4, leads to a prediction of a high marriage rate for this group following discharge. This, too, should be considered in planning rehabilitation programs (*8*). The married individuals as a group are not as old as those divorced, separated, and widowed. Proportionately more nonwhites than whites come from broken homes, and conversely, the former group has a smaller porportion of single individuals. Since the rehabilitation of the tuberculous patient involves consideration of the type of family unit to which he belongs, such statistical findings as the above should be augmented by case studies of representatives of each marital category to determine the relationship between marital status and willingness to accept sanatorium care and rehabilitation.

TABLE 5.—*Number and percent of persons in the study group by stage of disease on admission, race, and sex*

Race and sex	Stage of disease on admission			
	All diagnoses	Minimal	Moderately advanced	Far advanced
	Number			
All races:				
Total	1,245	183	496	566
Male	677	86	272	319
Female	568	97	224	247
White:				
Total	1,109	164	452	493
Male	613	76	249	288
Female	496	88	203	205
Nonwhite:				
Total	136	19	44	73
Male	64	10	23	31
Female	72	9	21	42
	Percent			
All races:				
Total	100.0	14.7	39.8	45.5
Male	100.0	12.7	40.2	47.1
Female	100.0	17.1	39.4	43.5
White:				
Total	100.0	14.8	40.8	44.4
Male	100.0	12.4	40.6	47.0
Female	100.0	17.7	40.9	41.4
Nonwhite:				
Total	100.0	14.0	32.3	53.7
Male	100.0	15.6	35.9	48.5
Female	100.0	12.5	29.2	58.3

Stage of disease on admission.—Table 5 shows that 15 percent of the group were minimal cases, 40 percent were moderately advanced, and 45 percent far advanced on admission. These proportions vary somewhat from the observations of Nimitz (*9*) who reports that on a nationwide basis 13 percent are minimal, 32 percent moderately advanced, and 55 percent far advanced. The smaller proportion of far advanced cases in this New Jersey study arises from the exclusion of first admissions whose sanatorium stays terminated in death. Within each stage there were also variations by race and sex. For example, the percent of moderately advanced cases is approximately the same for white males and white females, about 41 percent, but of the nonwhite males 36 percent were classified as moderately advanced as against 30 percent for nonwhite females. The nonwhite females had the greatest percentage of far advanced cases (58 percent), which was very different from the white female group of the same diagnostic category (41 percent). The effect of stage of disease on mortality by sex and race will be one of the subjects discussed in the paper to follow.

TABLE 6.—*Number and percent of persons in the study group by age and stage of disease on admission*

Age groups	Stage of disease on admission			
	Total	Minimal	Moderately advanced	Far advanced
Total	1,245	183	496	566
17-19	83	22	38	23
20-29	452	73	189	190
30-39	288	40	116	132
40-49	206	24	78	104
50 and over	216	24	75	117
	Percent			
Total	100.0	100.0	100.0	100.0
17-19	6.7	12.0	7.7	4.1
20-29	36.3	39.9	38.1	33.5
30-39	23.1	21.9	23.4	23.3
40-49	16.5	13.1	15.7	18.4
50 and over	17.4	13.1	15.1	20.7

Older persons were admitted in the more advanced stages of disease (table 6). Any analysis of the subsequent history of discharged patients should therefore be made age-specific, so that this fact and the expected increase in mortality rates associated with increasing age may be controlled.

TABLE 7.—*Number and percent of persons in the study group by clinical status on discharge, sex, and race*

Clinical status on discharge	Number in each racial group					
	Males			Females		
	All races	White	Nonwhite	All races	White	Nonwhite
Total	677	613	64	568	496	72
Arrested	60	55	5	81	75	6
Apparently arrested	130	119	11	100	88	12
Quiescent	105	96	9	74	63	11
Improved	215	195	20	213	188	25
Unimproved	167	148	19	100	82	18
	Percent					
Total	100.0	100.0	100.0	100.0	100.0	100.0
Arrested	8.9	9.0	7.8	14.3	15.1	8.3
Apparently arrested	19.2	19.4	17.2	17.6	17.8	16.7
Quiescent	15.5	15.7	14.1	13.0	12.7	15.3
Improved	31.7	31.8	31.2	37.5	37.9	34.7
Unimproved	24.7	24.1	29.7	17.6	16.5	25.0

Clinical status upon discharge.—According to table 7, 9 percent of the group were discharged in an arrested condition after their first period of sanatorium care. White females had the highest proportion in this category, 15 percent; white males, 9 percent; and nonwhite males and females, 8 percent. There were proportionately more nonwhite patients than white patients discharged in the active categories. It is evident from this table that the white females leave the sanatorium in the most favorable condition, while nonwhite males leave in the least promising state of health. This was reflected in the death and readmission rates for the 5 years subsequent to discharge, which were generally lowest for white females.

TABLE 8.—*Number and percent of persons in the study group by stage of disease on admission and clinical status on discharge*

Stage of disease on admission	Clinical status on discharge					
	Total	Arrested	Apparently arrested	Quiescent	Improved	Unimproved
Total	1,245	141	230	179	428	267
Minimal	183	50	39	34	43	17
Moderately advanced	496	56	131	71	158	80
Far advanced	566	35	60	74	227	170
	Percentage distribution by stage of disease					
Total	100.0	11.3	18.5	14.4	34.4	21.4
Minimal	100.0	27.3	21.3	18.6	23.5	9.3
Moderately advanced	100.0	11.3	26.4	14.3	31.9	16.1
Far advanced	100.0	6.2	10.6	13.1	40.1	30.0
	Percentage distribution by clinical status on discharge					
Total	100.0	100.0	100.0	100.0	100.0	100.0
Minimal	14.7	35.5	17.0	19.0	10.0	6.4
Moderately advanced	39.8	39.7	57.0	39.7	36.7	30.0
Far advanced	45.5	24.8	26.0	41.3	53.3	63.6

Table 8 presents a summary of persons in each diagnostic group, distributed according to their clinical status upon discharge. Two proportionate distributions follow. The first employs as its base the stage of disease on admission, and shows the condition at time of discharge of the minimal, moderately advanced and far advanced patients. The second distribution is based on the clinical status on discharge so that it shows how many of the arrested, apparently arrested, and other categories, were minimal, moderately or far advanced on admission. The great advantages of admission in the early stages of the disease are evident from this table, for the minimal admissions, which constituted only about 15 percent of all persons included in the study, comprised over 35 percent of those with arrested disease on discharge. On discharge, 49 percent of the minimal, and only 17 percent of the far advanced cases were in the arrested categories. Ten percent of the minimal, compared to 30 percent of the far advanced cases were unimproved on discharge. Of those discharged unimproved, two-thirds were far advanced on admission.

Manner of discharge.—An important element in the treatment of the tuberculous is the patient's ability to accept both the diagnosis and the recommended treatment, including sanatorium care. The inability of many patients to adapt themselves to institutional living often results in their leaving the sanatoria against advice. No statistical studies have previously been made analyzing the multiple characteristics of a patient population in relation to discharge "with consent" and "against advice."

TABLE 9.—*Number of persons in the study group by marital status, race, and manner of discharge showing proportion leaving against advice*

Race and marital status	Total	With consent	Against advice	Proportion discharged against advice
Total, all races	1,245	728	517	41.5
Single	502	340	162	32.3
Married	627	328	299	47.7
Other [1]	116	60	56	48.3
Total, white	1,109	665	444	40.0
Single	458	317	141	30.8
Married	562	301	261	46.4
Other [1]	89	47	42	47.2
Total, nonwhite	136	63	73	53.7
Single	44	23	21	47.7
Married	65	27	38	58.5
Other [1]	27	13	14	51.9

[1] "Other" includes divorced, widowed, separated.

While it is true that there is wide variation in applying the terms "with consent" and "against advice," it may be assumed that the patient discharged against advice is one who probably did not receive full benefit from sanatorium care. Almost 42 percent of all first discharges were against medical advice (table 9). This proportion was consistently higher for the nonwhite group as a whole (54 percent vs. 40 percent); it was also higher for the nonwhite patients in each marital category. In addition, both male and female single patients comprised the smallest proportion leaving against advice.

There was little difference observed in the proportions of males and females leaving against advice. Older patients of both sexes left against advice in larger proportions than the younger age groups (table 10).

The proportion leaving against advice varies with the stage of the disease, increasing as the disease become more advanced. Whereas 25 percent of those who entered the sanatorium as minimal cases left against advice, 39 percent of the moderately advanced and 50

TABLE 10.—*Number and percent of persons in the study group by age, sex, and manner of discharge*

Age groups	Males			Females		
	Total	With consent	Against advice	Total	With consent	Against advice
Total	677	394	283	568	334	234
17-19	29	17	12	54	39	15
20-29	174	109	65	278	167	111
30-39	168	108	60	120	63	57
40-49	139	70	69	67	39	28
50 and over	167	90	77	49	26	23
	PERCENT					
Total	100.0	58.2	41.8	100.0	58.8	41.2
17-19	100.0	58.6	41.4	100.0	72.2	27.8
20-29	100.0	62.6	37.4	100.0	60.1	39.9
30-39	100.0	64.3	35.7	100.0	52.5	47.5
40-49	100.0	50.4	49.6	100.0	58.2	41.8
50 and over	100.0	53.9	46.1	100.0	53.1	46.9

percent of the far advanced were so discharged. The progression for males and females, respectively, was found to be similar. The return home of so large a proportion of far advanced cases presents a responsibility of considerable magnitude to those concerned with tuberculosis control in the communities to which they return. The

TABLE 11.—*Number of persons in the study group by stage of disease on admission, length of stay, sex, and manner of discharge, showing proportion leaving against advice*

Stage of disease on admission and length of stay	Both sexes				Males				Females			
	Total	With consent	Against advice	Proportion leaving against advice	Total	With consent	Against advice	Proportion leaving against advice	Total	With consent	Against advice	Proportion leaving against advice
All stages	1,245	728	517	41.5	677	394	283	41.8	568	334	234	41.2
Under 3 months	247	76	171	69.2	155	48	107	69.0	92	28	64	69.6
3-5 months	202	110	92	45.5	116	59	57	49.1	86	51	35	40.7
6-11 months	340	214	126	37.1	184	119	65	35.3	156	95	61	39.1
12 months and over	456	328	128	28.1	222	168	54	24.3	234	160	74	31.6
Minimal	183	138	45	24.6	86	65	21	24.4	97	73	24	24.7
Under 3 months	48	23	25	52.1	26	14	12	46.2	22	9	13	59.1
3-5 months	45	38	7	15.6	21	17	4	19.0	24	21	3	12.5
6-11 months	65	56	9	13.8	31	27	4	12.9	34	29	5	14.7
12 months and over	25	21	4	16.0	8	7	1	12.5	17	14	3	17.6
Moderately advanced	496	304	192	38.7	272	164	108	39.7	224	140	84	37.5
Under 3 months	101	31	70	69.3	70	22	48	68.6	31	9	22	71.0
3-5 months	76	41	35	46.1	38	21	17	44.7	38	20	18	47.4
6-11 months	133	82	51	38.3	71	42	29	40.8	62	40	22	35.5
12 months and over	186	150	36	19.4	93	79	14	15.1	93	71	22	23.7
Far advanced	566	286	280	49.5	319	165	154	48.2	247	121	126	51.0
Under 3 months	98	22	76	77.6	59	12	47	79.7	39	10	29	74.4
3-5 months	81	31	50	61.7	57	21	36	63.2	24	10	14	58.3
6-11 months	142	76	66	46.5	82	50	32	39.0	60	26	34	56.7
12 months and over	245	157	88	35.9	121	82	39	32.2	124	75	49	39.5

longer period of hospitalization generally required at later stages of the disease partially explains the observed variation for the longer the required stay, the greater the opportunity for leaving against advice. Table 11 presents the proportion of males and females leaving against advice both by stage of disease and length of stay.

CONCLUSIONS

The method of using centralized records for the study of persons discharged from sanatoria, in addition to being simple and inexpensive, has several major advantages. Comparable studies encompassing larger groups of patients can be made in great numbers and at frequent intervals; also, the effect of untraced persons on over-all data can be assessed. Studies of this kind, made periodically and under uniform conditions, will reveal trends in postsanatorium survival and readmission rates, and will permit the determination of death rates by such factors as age, race, sex, marital status, stage of disease, condition on discharge, and manner of discharge.

An attempt was made to compare the composition of the New Jersey group with the populations used in earlier studies of discharged patients. However; all of the earlier investigations differed from the present study in the criteria employed in selecting cases for follow-up. Moreover, it was found that methods employed for selecting cases in the earlier studies differed widely from one study to another. It was therefore difficult to make comparisons or to arrive at proper conclusions.

Earlier studies, too, were of limited application because, by combining the data concerning patients discharged over a span of years, they obscured such factors as year-to-year changes in composition of the patient population, changes in methods of medical care, and mortality trends. For example, the combining into one group of all live discharges from one State and 14 county sanatoria for each year from 1925 to 1935 in the Minnesota study by Hilleboe (*2*) conceals changes in methods of tuberculosis control during the 10-year period, and makes it impossible to compare survival rates with those found in later studies. The Stephens study (*10*), in grouping the 20-year findings relating to reactivation of tuberculosis among "cured" cases embodies these same difficulties.

Another study (*11*), covering patients discharged from Maryland tuberculosis sanatoria from 1935 to 1940, though termed a 5-year follow-up, did not actually follow the entire group of patients for the full 5-year period. Instead, it followed for the full period only those cases discharged in the first year, and observed the remaining patients for shorter periods, depending upon date of discharge. This procedure is feasible in life-table construction, since the population is adjusted each year to remove those cases who are no longer under observation;

the death rates yielded by this method, however, are not as significant as those found when all patients are followed for a given length of time. The present study, if repeated at fixed intervals, with uniform periods of follow-up, would reveal information significant to workers in tuberculosis control.

Another advantage of the use of the present method lies in the fact that data can be consistently analyzed for any given factor which may influence trends. Because data obtained by this method are consistent and comparable, differences in population characteristics which may be discovered from study to study can be controlled. Such a comparison was not possible with the Hilleboe study (*2*), where the survival rates are presented for *both* sexes in a single age group, 20–49, by stage of disease and sputum status upon discharge. In his study, although the author recognized that "sex, length of stay, number of readmissions, occupation and collapse therapy" affect survival, all these factors are omitted in the calculation of survival and mortality rates.

A comparison of the 5-year death rates found in the present New Jersey study with those presented by Hilleboe in the Minnesota analysis, adjusted to make them as nearly comparable as possible, reveals marked similarity in rates. However, since there is no way of ascertaining whether the two groups of patients involved are actually comparable with respect to age, sex, and other characteristics, no valid conclusions can be drawn from the comparison. Where differences in survival rates are observable in these two studies, it is impossible to determine whether they are attributable to improvements in methods of treatment, differences in age and sex distribution, differences in marital status proportions, or changes in the proportions of patients discharged in the arrested categories.

Another study (*12*), concerning Minnesota ex-patients, not only included long spans of time (1916–25 and 1926–35), but also confined itself to *single* admissions with 90 days or more of residence in an institution. Thus, those patients who were so ill that they had to return to the sanatorium for further treatment were ignored. As would be expected, even though the periods studied were much earlier, the survival rates presented are higher than those found for the New Jersey discharges.

The study of patients discharged from Maryland sanatoria (*11*), had a number of features similar to the New Jersey study. It included a break-down by race and the stage of disease on admission but ignored sex and age. The New Jersey patients, when compared to the Maryland groups, were found to have a lower death rate among far advanced cases, about the same rate among moderately advanced cases, and a higher rate among minimals. The variations could not be interpreted to determine whether they were due to different methods of analysis, as previously discussed, differences in the composition of the respective groups, or improvements in methods of treatment between the two 5-year periods.

The most comprehensive study of sanatoria discharges previously made was the Whitney and Dempsey 5-year follow-up study (*5*) of 6,906 patients discharged alive in 1933 from 75 sanatoria in 16 States. This study included readmissions in the base year. When compared to the whole group of 1,678 patients in the New Jersey study, the groups were found to be sufficiently similar to indicate that the New Jersey group was a representative cross section of sanatorium discharges in general.

The proportions of white and nonwhite cases and of minimal, moderately advanced and far advanced cases were about the same in the two studies. Unlike New Jersey, however, there were more females than males in the Whitney and Dempsey study. The median age of the women was identical, but the male patients in New Jersey were older. On discharge, larger proportions of the New Jersey patients were placed in the arrested categories, which in turn was reflected in a lower gross mortality rate and a lower rate for the far advanced cases. More of the New Jersey patients were discharged against advice than Whitney and Dempsey reported. The latter did not use the life-table method of analysis, and suggested that future studies of discharged patients be confined to first admissions in the base period, as has been the policy in the analysis of the New Jersey data.

The method used in the present study made it possible to ascertain the characteristics of the untraced population in comparison with those of the rest of the study group. By so doing, it was possible to assess the exact effect on general findings of the lack of follow-up information concerning untraced patients. Earlier studies have approached this problem diversely. In the Hilleboe study (*2*), the untraced persons were omitted from consideration entirely, while, in the Maryland study (*11*), they were included and considered to be unselected in regard to mortality. The latter assumption, however, can be considered justifiable only when the composition of the untraced group is known to be essentially like that of the traced patients.

These conclusions demonstrate that the method employed in the New Jersey study provides adequate data for a description of the demographic and clinical characteristics of persons discharged from tuberculosis hospitals.

SUMMARY

1. A method has been developed for studying the characteristics of persons discharged from tuberculosis sanatoria and determining significant events in their subsequent history.

2. The outstanding feature of the method is its use of available

central records for the collection of data which are suited to new applications of the life-table method of analysis. The application of the life-table techniques to the analysis of mortality and readmission rates will be presented in two future papers. Another will deal with discharge "with consent" and "against advice."

3. Within the limits of the accuracy and completeness of the central files, the method has been found equal or superior to the use of personal interviews for following patients after discharge.

4. In this first report the method has been described and then applied to the study of 1,245 persons discharged alive from New Jersey sanatoria between July 1, 1941, and June 30, 1942.

5. A description of the group studied, with respect to selected characteristics, shows that:

  a. There were 119 males per 100 females.
  b. The proportion of nonwhite persons (11 percent) is twice as large as the proportion reported in the 1940 census for the State.
  c. The median age of the men was 37 years and of the women, 27 years, at the time of first admission.
  d. Nearly 60 percent of the females were *under* 30 years of age, and an even larger proportion of the nonwhite females had not reached their thirtieth birthday at the time of admission to the sanatorium.
  e. Nearly 70 percent of the men were *over* 30 years of age. The median age of the nonwhite males was 45 whereas that of the white males was 37.
  f. More than half of the men were married. The proportion of married women (45.8 percent) was about equal to the proportion of single women (44 percent). More nonwhite patients came from broken homes (20 percent vs. 8 percent).
  g. The admission diagnosis for 13 percent of the group was minimal tuberculosis; 40 percent had moderately advanced, and 47 percent far advanced disease.
  h. The proportions of white and nonwhite patients leaving sanatoria against advice were 40 percent and 54 percent, respectively. A disproportionately large number of older persons left against advice. Married men, divorced, widowed, and separated men and women were the marital groups most likely to leave against advice. There is a direct relationship between the proportion leaving against advice and the stage of disease on admission; the proportion leaving against advice is inversely related to the length of stay.
  i. On discharge there were larger proportions of white females in the *arrested* and *quiescent* categories than any other group. Nonwhite males comprised the greatest proportion in the

active categories. Patients classified as minimal on admission generally left the sanatoria in an arrested or quiescent condition while those whose disease was far advanced comprised 70 percent of the active categories when discharged.

6. The method of using central files such as central case registers for following patients discharged from sanatoria can produce a great number of studies repeated at frequent intervals. The studies would provide a large body of data, comparable in all respects, for determining the answers to many unsolved problems in tuberculosis control.

ACKNOWLEDGMENT

The authors are indebted to Dr. Jacob Yerushalmy, Professor of Biostatistics, University of California, under whose direction the initial planning, collection of data, and preliminary analyses were conducted while he was Principal Statistician with the Tuberculosis Control Division. Special acknowledgment is made of the invaluable assistance of Mr. Edward S. Weiss, Statistician, Tuberculosis Control Division, for his counsel in the preparation of this manuscript. Acknowledgment is also made of the assistance given the authors by Dr. Emil Frankel, Director of the Division of Research and Statistics, New Jersey Department of Institutions and Agencies; and by Dr. A. Joseph Hughes, Chief of the Tuberculosis Control Division; Dr. Roscoe D. Kandle, former Director of the Bureau of Preventable Diseases; and Mrs. Sara Errickson, R. N., Public Health Nursing Consultant, all of the State of New Jersey Department of Health.

REFERENCES

(1) Hilleboe, H. E.: Comparative mortality of patients discharged from tuberculosis sanatoria. Am. Rev. Tuberc. **34:** 713 (1936).

(2) Hilleboe, H. E.: Follow-up study of patients discharged from tuberculosis sanatoria. Nat. Tuberc. A. Tr. **34:** 149 (1938).

(3) Brieger, Emil: Statistical classification. A new type of enquiry card for tuberculosis statistics. Papworth Research Bull. **2:** 113 (1938).

(4) Kiefer, Norvin: Present concepts of rehabilitation in tuberculosis. A review of the literature, 1938–47. Nat. Tuberc. Assoc., New York (In press).

(5) Whitney, Jessamine S. and Dempsey, Mary V.: A study of patients discharged alive from tuberculosis sanatoria in 1933. Nat. Tuberc. Assoc., Social Research Series, No. 8, New York, 1942.

(6) State central case record systems and local case registers for tuberculosis. Federal Security Agency, U. S. Public Health Service, Tuberculosis Control Division, Washington, D. C., 1947.

(7) Tuberculosis facilities in the United States. J. A. M. A. **114:** 791 (1940).

(8) Hudson, Holland: Young married women patients. Bull. Nat. Tuberc. Assoc. **25:** 169 (1939).

(9) Nimitz, H. J.: The problem of tuberculosis in the average community. Diseases of the Chest **10:** 528 (1944).

(10) Stephens, Margaret G.: Follow-up of 1,041 tuberculosis patients. Am. Rev. Tuberc. **44:** 451 (1941).

(11) Gauld, Ross L., Halliday, C. H., Cullen, Victor F., and Fales, W. Thurber: A five year follow-up of discharges from Maryland Tuberculosis Sanatoria. Am. J. Pub. Health **31:** 568 (1941).

(12) Hastings, D. R. and Doerr, Esther R.: Follow-up study of tuberculous patients. Am. Rev. Tuberc. **40:** 131 (1939).

SOME ECONOMIC AND EMOTIONAL PROBLEMS OF THE TUBERCULOSIS PATIENT AND HIS FAMILY[1]

By Sophia Bloom, A. M., *Chief Medical Social Consultant, Tuberculosis Control Division, United States Public Health Service*

The impact of the diagnosis of tuberculosis is usually severe, both for the individual patient and the community. The patient reacts to the medical problem and the consequent social dislocation in a variety of ways, but for no one is it easy. It follows that in addition to medical care we must consider social care an essential objective in a comprehensive and effective control program planned to eradicate tuberculosis.

Whenever the economic, emotional, or other social problems of the tuberculous are considered, it is usual to think only of those persons whose livelihood is threatened, who cannot pay for medical and sanatorium care, and who must ask for public relief for their families. It is not so frequently recognized that all persons suffering from tuberculosis have economic and social problems which are an inherent part of the illness. Even if some patients can pay for sanatorium care, it is often at considerable sacrifice. Living standards for the family may be sharply reduced. Strain and anxiety may result when there is constant worry over finances, when the education of children is interrupted or ended, and family plans disrupted. Emotional adjustments of a profound and complex nature have to be made by the stable person as well as by the unstable, and the difference is merely one of degree of intensity.

It is estimated that about 500,000 persons have tuberculosis at the present time. About one-half of these are known to health departments. When we consider that the majority of these persons are adults who probably have families and dependents, we realize that a large segment of our population either suffers directly from the disease or is seriously affected by it.

Although it has long been recognized that in addition to medical needs the tuberculous patient may have a multitude of problems, it is only recently that widespread efforts have been made to evaluate and meet the social needs of the individual and the community. These social needs are largely emotional and economic and because they are interrelated, cannot be arbitrarily separated. I shall, however, discuss the basic economic difficulties and some of the major emotional problems created and intensified by tuberculosis.

Tuberculosis is a chronic and expensive disease, and few persons are able, alone, to meet the cost of medical care. Moreover, most patients cannot support their families throughout the period of financial dependency. The time involved is usually lengthy, since it includes the total period of medical treatment and rehabilitation. The patient must, therefore, often ask for help from the community for either medical care, support, or both.

---

[1] Speech given by Miss Sophia Bloom at 34th Annual Mississippi Valley Conference on Tuberculosis September 8, 9, 10, 1947, Chicago, Ill.

There are, then, two major economic problems to be considered:

1. The long-drawn-out costs of expensive medical care.
2. The cost to the community of financial relief and medical care.

The extent to which the financial problem is met varies greatly in different communities, both with regard to public and private resources. Private relief-giving agencies are often reluctant to accept tuberculosis patients for financial assistance primarily because of the long-time and expensive problems which they present, and because of the agencies' limited funds.

Various forms of public relief are available in this country. For the most part persons without income depend upon public relief, of which there are three forms: (1) general relief, (2) the categorical assistances—Aid to Dependent Children, Old Age Assistance, Aid to the Blind—and (3) the social insurances. Social insurance has the very important advantage of providing benefits as a right and arouses no feelings of humiliation, but this program is not yet sufficiently general in coverage, and the form which could protect the tuberculous patient—disability insurance—has not yet been developed.

General relief and the categorical assistances are the usual sources of support and are often used to supplement each other. They differ in two respects: the funds for the assistance programs come from Federal, State and local sources, and those for general relief from State and local funds only. The standards of the assistance programs may be higher.

Marked variation and inequality of relief distribution exist among the various States and local communities. Federal grants-in-aid received by the States must be matched by State funds, and most of the States receive the three kinds of grant-in-aid funds. In a number of States there is no State-wide general relief, and in those States the financial care of persons without resources is the responsibility of the county. The only aid may be from the categorical assistance programs which in tuberculous families is usually Aid to Dependent Children.

The sums given in many places are insufficient to maintain a minimum standard of living. In some States, too, there is a ceiling or limit on the amount available for a given family, regardless of its size or the circumstances, and the amount of relief given is not determined by a family's needs but by arbitrary administrative or legal regulations. I was told recently of one State which raised the ceiling from $25 to $75 per month. Even this increase is insufficient to maintain most families. We find also, and often, that even where there are laws that permit appropriations for relief, and where budgets are devised to set the minimum standard, the necessary funds are, for one reason or another, not appropriated. As a result, needy people may receive only a percentage of a minimum allowance. When this occurs the intent of the law is not fulfilled and the needs of the people are not met.

In a few places, relief budgets are maintained at the minimum, and in several places small additional amounts are given to the families of the tuberculous. This, however, is exceptional. In much of the country, families of the tuberculous like other persons unable to maintain themselves, are living for varying periods of time extending often over many years, on sums of money which, for the most part, are obviously inadequate and, at best, are scarcely sufficient to meet the barest necessities of life. This is hard on all dependent persons. We cannot help but wonder about its physical effects on people who are ill or who have been exposed to a disease such as tuberculosis. Normally, we think such persons may require additional, rather than less, care.

Sometimes, those of us who care for the patients, in our desire to help them and to relieve financial distress, may emphasize the fact that the family is eligible to apply for relief. We tell the man who is concerned about his dependents that he need not worry, that his wife can go to the nearest department of welfare and apply for assistance. It is true that she can, and often she does, but the patient may still have cause for concern. In addition to the blow to his pride, and his chagrin that he is no longer able to care for his family, there is the knowledge that his wife may have a difficult and possibly humiliating experience. It will disturb him if the amount of aid received will not be enough to meet the family's actual physical needs alone, to say nothing of the social and recreational interests that all people must have for health and happiness. Is it possible for such a man, facing a long period in the sanatorium, and another period of convalescence and rehabilitation, not to worry about the present and future well-being of his family? Living on inadequate or on barely adequate sums presents a constant source of anxiety, resentment and frustration. When there is deprivation in the family the patient cannot help but share the suffering of his family.

In other instances, relief is not available or is so limited that patients cannot accept the medical attention offered because they must continue to support their families. This was exemplified by the case of a laborer with three small children who was forced to continue working on the roads after a diagnosis of tuberculosis. When relief assistance was finally made available the disease had progressed from one lung to the other, and his wife was discovered to have tuberculosis also!

For the patient with tuberculosis, economic insecurity intensifies any existing emotional problems of anxiety over illness, fears for the future, and the sense of personal inadequacy and insecurity. It is one more traumatic problem in a series of problems that begins with the diagnosis, or earlier, and continues through the period of rehabilitation. Physical recovery may be seriously affected or retarded. We all know too well the patients who return to work too soon in order to earn a living, and who frequently suffer recurrences, at increased cost to themselves and the community.

Two other important factors in the medical and social care of the patient are the restrictions and difficulties of the residence laws and of the means test. That the State is responsible for the welfare of its people was accepted in the structure of English government 350 years ago. In order that no geographical section be unduly burdened with people from other areas, the residence, or settlement laws became at that time part of the pattern of State responsibility. This concept has carried over, and the means test, originally devised to determine eligibility for relief at less than the lowest prevailing wage rate (rather than according to our present day concept of need) has also remained in the pattern, although 6 States do not apply it to tuberculosis. Both present problems to us today in the care of the tuberculous, and in the control of a contagious disease which respects neither State nor county boundaries, nor the economic status of individuals.

Complex residence laws make it possible for a person to lose residence in one locality before he gains it in another. The length of time required to secure legal settlement in the various States ranges from 1 year to many years. A person who leaves one State may lose his residence after 1 year's absence but may not yet have become a legal resident of the new State. If he becomes ill, it is necessary to determine his place of residence to ascertain eligibility for medical care and often neither State wishes to assume responsibility. It may be months before the matter is resolved, with consequent difficulty for the patient. Intrastate, as well as interstate, residence problems exist when individuals have lived in the State long enough to gain State residence, but not long enough to gain county residence. In such instances, the State can assume the responsibility with or without charge to the county. The patient who is a nonresident of a given locality is just as much a health menace as the patient who has residence. Even if we ignore human values, it is obvious that the community's health is endangered when hospitalization is refused the nonresident. There are many instances of refusal or delay in providing medical care to sick people who have no residence.

Briefly, then, we find that provision for economic care ranges from little assistance in some communities to a minimum relief standard in others, with many intermediate variations. This only results in tragic experiences for most of those who, their lives complicated by a serious illness, must depend upon others for support.

The economic problems of tuberculosis, with some reference to the emotional implications of financial insecurity, have been considered. However, other problems in tuberculosis, particularly the emotional ones connected with the acceptance of the diagnosis, are of great significance. There are many reasons for the emotional difficulties experienced by almost all patients despite economic advantage, education or social position. Among these are the shock of the diagnosis, fears, anxieties, superstitions, sense of shame, and despair. Almost all patients show signs of resisting the diagnosis, and of refusing to accept it, and this resistance and nonacceptance may increase rather than lessen with time. We are confronted with resistance to the diagnosis, resistance to sanatorium care, resistance to careful rehabilitation, resistance, in short, to tuberculosis! We are all familiar with this and we all struggle with it daily. Resistance may lead to a display of anger, sullenness, refusal to follow directions, leaving the sanatorium against advice, a false and too speedy acquiescence, or it may take some other method of displaying itself.

Regardless of the way the patient shows or conceals his feelings, we know he is emotionally affected. Frequently during shock intelligent people behave as though they were stupid or lacked ordinary common sense. Often such a reaction is surprising, particularly if it continues over any length of time. We all know that patients, in order to handle tuberculosis, need to learn certain facts about themselves and their illness. In our efforts to help them we may devote almost all our energies to explaining facts to them. We may forget that people who are emotionally upset do not take in such information, often do not even hear our words. Preoccupied by an inner fear, the sense of security and adjustment gone or badly shaken, they cannot listen to and absorb our explanations. The facts are needed, certainly, and these should be given when the patients show they want them and in the amounts that they are able to absorb at a given time. But even before and along with this we must respond sensitively to their emotional needs. The doctors, nurses, social workers, and others concerned with the care of the patient, can help immeasurably by conveying genuine understanding of the severity of the blow and by appreciating the patient's point of view. If we are able to help him feel that he and the diagnosis are accepted by others, the more possible will it be for him to accept the diagnosis and himself.

Problems often become manifest at the point of diagnosis, or before, if the diagnosis has been in doubt and the patient has had to wait during an anxious period for the final decision. The person whose defenses have been suddenly and harshly penetrated, who is suddenly faced with the necessity of an immediate adjustment to a new and terrifying situation, will respond as he has been accustomed to respond to other life demands. If he is sufficiently secure emotionally within himself and with those he considers closest to him and upon whom he depends, he will show signs, sooner or later, of the strength to meet the blow. He will turn for comfort to the person or persons upon whom he depends. If he receives this comfort, he is strengthened; if it is not given, he will suffer even more. If he is an insecure person, it will be harder for him to meet this new and frightening situation. Many patients, when first diagnosed, show as the first reaction very real apprehension as to the reaction of the husband, or wife, or sister, or whoever fills this important role in his life. I remember the young woman whose first reaction after learning the diagnosis showed some insecurity with respect to her husband. Her comments were all in relation to him. He might be angry, he would not like it, he would be angry if she left the children, what would he say, and so on. She was obviously unable to think of anything else, and could not talk about herself. This woman and her husband returned together the next day, and her first words showed great relief. Her husband had said, "It's all right; she should do what the doctor said." He was very helpful to her throughout the time of illness, and she adjusted to hospital routine and discipline very quickly, showing always a strong dependence upon her husband who adequately met her need for security.

Another woman, who was unable to speak when told the diagnosis, telephoned calmly two days later, "to go ahead with getting her in the hospital." Her sister, who was older and whom she regarded as a mother, had told her that she wanted her to do what the doctor said and that she would take care of her always.

The patient's emotions are an integral part of the realities of his life. If he faces financial insecurity he has emotions about it; if his home is to be broken up, his children sent away, or if his wife goes to work, he may experience severe sensations of humiliation, doubt, shame, frustration, and resentment. If he feels a loss of status and prestige he will be increasingly sensitive. Many problems are made worse by the stress and strain of an illness such as tuberculosis. A shaky marriage may crash altogether. The man who formerly felt his wife respected him only because he provided for the family may now feel he has lost everything. The woman who fears that she may lose her husband anyway, may be convinced that tuberculosis represents the end of things for her. The young person, believing his career thwarted, may lose hope and ambition. Many people, who defy treatment and refuse to follow directions, may in reality be struggling against a desire to be dependent, to be cared for. Because they wish it so much, and are afraid of the wish, they struggle to maintain a show of independence and cannot relax quietly. Others, as we all know, seem to sink gladly into a way of life in which they are prevented from being independent, and from which they resist being helped to resume the activities of an independent adult life.

In view of the social problems mentioned, and many others not discussed, there has been a growing interest in extending social services for the tuberculous. Both the National Tuberculosis Association and the United States Public Health Service have been developing nationwide programs to encourage the extension of these services.

The social problems are, of course, of interest and concern to all professional persons caring for the patient. It is, however, the social worker who has the primary responsibility for social study and evaluation and for the social treatment based upon the facts and their relation to the personality, attitudes, and needs of the individual patient. In addition to financial problems and necessary social adjustments, such as care of children, many patients will require help with the emotional problems created, or intensified, by illness. It is the patient's relationships with others which help strengthen him during periods of emotional disturbance, and he will turn to the social worker for help in accordance with his need and her ability to meet this need. For example, if he is dependent, she may help by understanding why he needs to lean on others for a time, and will allow him to do so, without fostering the dependence. All persons engaged in the care of the patient need to understand his psychological and emotional behavior. The professional training and experience of the social worker give her an insight into human behavior and are an essential source of her case work skill and knowledge, her principal contribution to the care of the patient.

The social worker plays a part in the various aspects of tuberculosis control programs. Although the degree of activity may vary, the general functions remain the same in every phase of the treatment process. That is, the worker assumes the primary responsibility for studying, evaluating, and treating the social problems, either through her own efforts or in conjunction with others by referral to appropriate agencies.

In case finding, for example, which is the primary responsibility of the public health nurse, the social worker may be asked to help in particular situations. In medical treatment, she will work with those patients who need her help. The social worker, along with other professional persons, under the leadership of the physician, will help prepare the patient for a rehabilitation program, will evaluate his emotional readiness to participate in it, and will continue to help him throughout the entire period with the economic and social problems with which he will be faced.

Experience has shown that social workers can help effectively with the economic and social aspects of tuberculosis, and we hope the time will come when many more social workers will be available to work directly with patients and to act as consultants in health departments.

Fifty thousand persons died of tuberculosis last year in the United States. Today there are about a quarter of a million known cases. It will take the combined efforts of all of us, of society as a whole, to combat this disease and to care for its victims. Economically and emotionally, the disease can be devastating. We must meet these fundamental problems in tuberculosis if we are to achieve its eventual control.

ABSORPTION OF BACTERIOSTATIC QUANTITIES OF FATTY ACID FROM MEDIA BY LARGE INOCULA OF TUBERCLE BACILLI[1]

By: BERNARD D. DAVIS, *Surgeon, United States Public Health Service*

In the course of investigations in this laboratory concerned with the development of improved media for the cultivation of tubercle bacilli (*1*, *2*, *3*), it was observed that somewhat more rapid and dispersed growth could be obtained in liquid media by adding a small amount of a water-soluble ester of oleic acid, "Tween" 80,[2] while the addition of serum albumin permitted initiation of growth by small inocula. No further response was observed, however, upon the addition of any of the known vitamins.

It has long been known that large inocula of tubercle bacilli can grow in various synthetic media which fail to support initiation of growth by smaller (but not necessarily minute) inocula. Earlier workers (*4*) generally agreed that the success of the larger inocula was probably due to their contribution of unknown growth factors to the media. This assumption is supported by recent evidence that the characteristic lag in cell division of certain other bacteria (*5*) and yeast (*6*), observed following transfer from a growing culture in a synthetic medium to a fresh lot of the same medium, persists until metabolism of the organisms has produced in the medium a critical concentration of some unknown metabolite. The isolation of such a metabolite, if produced by tubercle bacilli, would be of value in the development of improved media. Accordingly, filtrates of cultures of the organism were studied.

---

[1] From the Office of Field Studies, Tuberculosis Control Division and the Laboratories of the Rockefeller Institute for Medical Research, New York, N. Y.

[2] Polyoxyethylene sorbitan monooleate, marketed under the trade mark "Tween" 80, and furnished through the courtesy of the Atlas Powder Co., Wilmington, Del.

It was found, as anticipated, that exposure of the medium to large numbers of growing tubercle bacilli did improve its capacity to support the growth of subsequent small inocula. Further study showed, however, that removal of inhibitory traces of fatty acid, rather than addition of a growth factor, was responsible for the improvement in the medium. This mechanism is consistent with Drea's report (*7*) that the capacity of synthetic media to support small inocula is considerably improved by precautions to avoid the introduction of traces of lipids and other toxic materials. It is also paralleled by our own observation (*8*) that serum albumin acts primarily as a protective rather than a nutritive growth factor.

METHODS

The bacteriological methods have been described in detail (*2*). The medium consisted of a salt mixture buffered by phosphate at pH 7.0, enzymatic casein hydrolysate, yeast autolysate, glucose, and 0.05 percent "Tween" 80; where specified, there was also added 0.1 percent bovine serum albumin (Fraction V, Armour), which had been heated in neutral solution at 56° C. for 30 minutes to destroy the activity of the lipase which contaminates it (*9*). The tubercle bacilli were a standard virulent human strain, H37Rv, which had been transferred many times in this "Tween"-albumin medium. Inocula are designated in the table as volumes of a 10-day-old culture containing approximately 1 mg. moist weight (0.2 mg. dry weight) per ml.

RESULTS

It was repeatedly observed that after tubercle bacilli had grown in the "Tween" medium without albumin for 3 to 7 days, the filtrate permitted initiation of growth by inocula 1/10 to 1/1,000 as large as the minimal effective inocula in control medium. In the "Tween"-albumin medium, however, which is much more receptive to small inocula, no difference in growth in filtrate and control medium was perceptible.

Elucidation of the role of albumin in the medium suggested an explanation of the mechanism by which albumin eliminated the benefits of exposure of the medium to growing tubercle bacilli. The "Tween" was found to contain sufficient free oleic acid (*10*) to make the medium bacteriostatic to small inocula of human tubercle bacilli, which are sensitive to less than 1 μg/ml.; the albumin acts as a protective growth factor by binding the fatty acid (*8*). It therefore appeared possible that the significant difference between filtrate and control medium might lie in the content of free fatty acid; such a difference would naturally be concealed in bacteriological experiments in the presence of albumin.

Accordingly, an experiment was undertaken to test the ability of large inocula of tubercle bacilli to remove oleic acid added in amounts which inhibit small inocula. In order to avoid complicating the results by the presence of unknown amounts of fatty acid in addition to those added, fatty acid-free "Tween" 80 (*11*) was used in the medium.

Volumes of 35 or 70 ml. of medium containing 0.05 percent fatty acid-free "Tween" 80 and varying concentrations of added oleic acid were autoclaved in flasks; certain lots were then inoculated with approximately 10^{-1} mg. of tubercle bacilli per 5 ml. All flasks were incubated for 6 days at 37° C., following which the inoculated media were separated from their fairly heavy growth of bacteria (estimated at 1 mg. per ml.) by filtration through sintered glass (Corning UF filters). Control experiments showed that filtration itself did not remove the fatty acid. The amount of water which had evaporated was replaced in all the media, and sterile oleic acid (in alkaline aqueous solution) and heated bovine serum albumin were added aseptically as indicated. The media were then distributed in volumes of 5 ml. in sterile, wide (25 mm.), metal-capped test tubes, inoculated with varying amounts of tubercle bacilli, and incubated at 37° C.

TABLE 1.—*Growth of small inocula of tubercle bacilli following absorption of bacteriostatic quantities of oleic acid by growth of large inocula*

Added before preliminary incubation			Added after infiltration			Inoculum (mg. moist weight per 5 ml.)				
Oleic acid (μg./ml.)	Tubercle bacilli (10^{-1} mg. per 5 ml.)		Oleic acid (μg./ml.)	Albumin (percent)		10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}
						Growth				
0	0	Incubate 6 days, filter	0	0	Inoculate sterile filtrate, incubate 10 days, record growth	4	3	2	1	½
2	0		0	0		4	2½	½	0	0
5	0		0	0		4	0	0	0	0
10	0		0	0		½	0	0	0	0
0			0	0		4	3	2	1½	1
2			0	0		4	2½	2	1½	½
5			0	0		4	2½	2	1½	½
10			0	0		4	3	2	1½	½
0			2	0		4	2½	½	0	0
0			5	0		2½	0	0	0	0
0			10	0		0	0	0	0	0
0	0		0	0.1		4	3½	2½	2½	2
10	0		0	0.1		4	3½	3	2½	1½

Growth recorded at 10 days
0=no visible growth
4=full growth

Growth after 10 days of incubation is recorded in table 1 as estimated visually (full growth corresponding to ca. 2 mg./ml). In the absence of added oleic acid, the filtrate had no significant advantage over the control medium.[3] As the concentration of oleic acid was increased to 2, 5, and 10 μg/ml., the capacity to support small inocula progressively fell, while the filtrates from these three media showed no deviation from the pristine capacity of the medium without added oleic acid to support small inocula. When the oleic acid was added after filtration, however, the behavior of the filtrates was identical with that of the control media.

---

[3] The earlier positive results had been obtained with unpurified "Tween" 80, which added to the medium 2 to 4 μg./ml. of oleic acid.

These results show clearly that: (1) growing tubercle bacilli eliminated the bacteriostatic effect of added oleic acid from the medium; (2) the bacteria did not contribute to the medium a protective growth factor capable of neutralizing subsequently added oleic acid; and (3) there is no evidence that the bacteria contributed a nutritive growth factor to the medium. It appears certain that the tubercle bacilli absorbed the free oleic acid. The other possible interpretation of the data, showing that the bacteria contributed a neutralizing substance to the medium in the presence of a trace of fatty acid, but not in its absence, cannot be considered seriously. In this connection it may be noted that the filtrates contained no protein detectable with concentrations of trichloracetic acid that precipitated amounts of albumin (0.01 percent) too dilute to be protective.

Preliminary experiments have indicated that the oleic acid cannot be removed by similar amounts of heat-killed bacilli; it is eliminated by bacterial metabolism rather than by simple adsorption. This utilization is consistent with the observation (*8, 12*) that fatty acids act as a growth factor for tubercle bacilli (especially the avian variety, but also to a slight extent the human strains) when the concentration of free fatty acid is kept low by the addition of albumin.

Although these results were obtained with media containing added oleic acid and "Tween" 80, fatty acids are such ubiquitous contaminants, and tubercle bacilli so extraordinarily sensitive to them, that there is little reason to doubt the relation of this phenomenon to the well-known failure of small inocula of tubercle bacilli to grow in other media. The phenomenon is also closely related to the problem of the lag phase. We have reported elsewhere (*8*) that the addition of serum albumin reduces the lag in the visible expansion of surface inocula of tubercle bacilli on Long's synthetic liquid medium, presumably acting by binding traces of fatty acids or other inhibitors. Both the failure of growth of small inocula and the lag of this bacterial species are therefore considered to be due to the presence in the media of toxic substances, which are antagonized by albumin and are tolerated and eliminated by large inocula. These observations, however, do not contradict the evidence that the lag phase or failure of growth of small inocula of other bacteria may depend upon the absence of growth factors rather than the presence of growth inhibitors.

SUMMARY

Large inocula of tubercle bacilli were grown in media containing oleic acid in concentrations inhibitory to small inocula. Filtrates of these media, obtained after growth, then supported initiation of growth by small inocula. The improvement in the filtrates is due to removal of fatty acid by tubercle bacilli. This absorption of fatty acid is suggested as the major cause of the usual difference in behavior of large and small inocula of tubercle bacilli in synthetic media.

No evidence was found that growing tubercle bacilli contribute a growth factor to the medium.

ACKNOWLEDGMENT

The constant interest and encouragement of Dr. R. J. Dubos and the technical assistance of Mrs. Harlean Cort are gratefully acknowledged.

ADDENDUM

The various "Tween"-albumin media (*1, 2, 3*), including the medium used in this paper, are very useful in experimental work in which dispersed growth is desirable. These media are not particularly suitable, however, for the diagnostic cultivation which is of chief concern in public health laboratories. A selective diagnostic medium will be described in a later publication by Dubos.

(*1*) Dubos, R. J.: Rapid and submerged growth of mycobacteria in liquid media. Proc. Soc. Exper. Biol. and Med., **58:** 361 (1945).

(*2*) Dubos, R. J., and Davis, B. D.: Factors affecting the growth of tubercle bacilli in liquid media. J. Exper. Med., **83:** 409 (1946).

(*3*) Dubos, R. J., Davis, B. D., Middlebrook, G., and Pierce, C.: The effect of water-soluble lipids on the growth and biological properties of tubercle bacilli. Am. Rev. Tuberc. **54:** 204 (1946).

(*4*) Wells, H. G., and Long, E. R.: The chemistry of tuberculosis. Williams and Wilkins, 1932, Ch. 1.

(*5*) Lodge, R. M., and Hinshelwood, C. N.: Physicochemical aspects of bacterial growth. Part IX. The lag phase of *Bact. lactis aerogenes.* J. Chem. Soc., p. 213 (1943).

(*6*) Taylor, H. E.: Ph. D. thesis, Columbia Univ., N. Y. (1945).

(*7*) Drea, W. F.: Growth of small numbers of tubercle bacilli, H37, in Long's liquid synthetic medium and some interfering factors. J. Bact., **44:** 149 (1942).

(*8*) Davis, B. D., and Dubos, R. J.: The binding of fatty acids by serum albumin, a protective growth factor in bacteriological media. J. Exper. Med., **86:** 215 (1947).

(*9*) Davis, B. D., and Dubos, R. J.: The inhibitory effect of lipase on bacterial growth in media containing fatty acid esters. J. Bact., **55:** 11 (1948).

(*10*) Davis, B. D.: The estimation of small amounts of fatty acid in the presence of polyoxyethylene sorbitan partial fatty acid esters ("Tween") and of serum proteins. Arch. Biochem., **15:** 351 (1947).

(*11*) Davis, B. D.: The preparation and stability of fatty acid-free polyoxyethylene sorbitan monooleate ("Tween" 80). Arch. Biochem., **15:** 359 (1947).

(*12*) Dubos, R. J.: The effect of lipids and serum albumin on bacterial growth. J. Exper. Med. **85:** 9 (1947).

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED MARCH 13, 1948

Summary

Following declines during the past 5 weeks, a slight net increase in the incidence of influenza was reported for the current week. A total of 7,447 cases was reported, as compared with 7,429 last week and a 5-year (1943–47) median of 4,744. The increase is accounted for chiefly in reports of 7 South Atlantic and South Central States showing a combined increase of 927 cases as follows (last week's figures in parentheses): South Carolina 841 (804), Tennessee 192 (81), Alabama 399 (205), Arkansas 266 (249), Louisiana 100 (55), Oklahoma 249 (137), and Texas 3,694 (3,283). This increase is offset in part by a combined decline of 763 cases in Virginia, Arizona, Oregon, and California. The total for the year to date is 107,067, as compared with 62,582 for the same period last year, which latter figure is also the 5-year median for the period.

Currently, 25 cases of poliomyelitis were reported in 14 States (last week 22, corresponding week last year 40, 5-year median 33). The total for the year to date is 317, as compared with 579 for the corresponding period last year and a 5-year median of 373.

Two cases of smallpox were reported, 1 each in Kansas and Oklahoma. The total since the first of the year is 31, as compared with 40 for the same period last year and 94 for the 5-year median.

Figures above the median expectancies have been reported since the first of the year for the following named diseases (last year's corresponding figures followed by the 5-year medians in parentheses): Influenza 107,067 (62,582–62,582); dysentery, amebic, 594 (449–270); dysentery, undefined, 2,254 (2,219–1,099); infectious encephalitis 91 (67–85); measles 131,543 (48,981–122,429); Rocky Mountain spotted fever 6 (9–4); undulant fever 887 (1,007–854).

Deaths registered during the week in 93 large cities in the United States totaled 9,789, as compared with 9,788 last week, 10,310 and 9,267, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 9,622. The total for the 11 weeks ended March 13 is 113,293, as compared with 110,459 for the corresponding period last year. Infant deaths totaled 639, as compared with 671 last week and 663 for the 3-year median. The total to date is 7,726, as compared with 9,010 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Mar. 13, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	Mar. 13, 1948	Mar. 8, 1947		Mar. 13, 1948	Mar. 8, 1947		Mar. 13, 1948	Mar. 8, 1947		Ma,. 13, 1948	Mar. 8, 1947	
NEW ENGLAND												
Maine	1	3	0	1	-------	-------	4	223	23	0	0	0
New Hampshire	0	0	0	-------	1	-------	1	11	5	0	0	0
Vermont	1	0	0	-------	25	-------	-------	267	121	0	0	1
Massachusetts	4	14	5	-------	-------	-------	786	489	489	0	1	6
Rhode Island	0	0	0	1	-------	17	2	232	38	0	0	1
Connecticut	0	1	1	8	1	3	58	883	443	5	1	4
MIDDLE ATLANTIC												
New York	8	9	14	[1] 29	[1] 3	[1] 4	2,090	314	1,941	8	7	29
New Jersey	4	3	2	3	7	9	1,227	342	1,417	2	0	10
Pennsylvania	11	11	11	(2)	[2] 4	[2] 3	1,057	572	1,323	7	5	26
EAST NORTH CENTRAL												
Ohio	8	13	10	4	5	8	1,107	927	450	0	3	16
Indiana	8	15	10	18	526	12	1,114	65	222	1	0	7
Illinois	5	5	7	10	12	12	2,606	49	887	6	6	16
Michigan [3]	5	5	5	11	5	5	1,873	108	630	3	0	12
Wisconsin	1	0	0	30	44	44	851	65	826	0	3	3
WEST NORTH CENTRAL												
Minnesota	2	10	5	-------	-------	-------	261	57	45	0	0	2
Iowa	2	2	4	-------	205	1	631	27	80	3	2	0
Missouri	13	2	4	7	239	6	189	7	365	2	1	9
North Dakota	0	3	2	-------	2	2	38	1	3	1	1	1
South Dakota	0	2	3	-------	-------	0	11	15	82	0	0	0
Nebraska	1	0	2	19	82	4	127	10	85	0	2	1
Kansas	1	5	5	61	3,395	6	28	14	374	1	0	1
SOUTH ATLANTIC												
Delaware	0	0	0	-------	-------	-------	33	4	22	0	0	0
Maryland [3]	3	3	6	8	5	7	82	43	73	3	2	4
District of Columbia	0	1	0	-------	2	2	175	18	72	0	0	2
Virginia	4	4	5	459	520	520	152	370	531	2	5	8
West Virginia	1	2	3	77	304	18	289	103	94	3	0	5
North Carolina	16	16	10	-------	-------	-------	12	259	259	4	0	6
South Carolina	8	4	6	841	504	522	60	68	68	0	1	3
Georgia	2	2	6	9	650	67	35	262	262	0	0	3
Florida	6	11	3	12	32	10	146	12	81	1	2	3
EAST SOUTH CENTRAL												
Kentucky	12	5	4	4	4	12	100	4	95	0	0	9
Tennessee	6	10	7	192	70	70	247	112	246	3	0	11
Alabama	3	7	6	399	233	229	95	61	132	2	2	6
Mississippi [3]	5	6	8	30	-------	-------	111	-------	-------	2	2	6
WEST SOUTH CENTRAL												
Arkansas	1	2	4	266	952	128	208	176	128	0	2	4
Louisiana	0	9	5	100	18	18	95	59	206	4	0	6
Oklahoma	2	8	3	249	272	107	34	3	36	1	3	3
Texas	21	19	40	3,694	11,624	1,689	1,680	251	1,261	11	10	19
MOUNTAIN												
Montana	1	0	0	26	120	14	100	212	172	0	0	0
Idaho	9	0	1	12	125	3	61	5	36	1	0	0
Wyoming	0	1	0	-------	33	14	43	24	27	1	0	0
Colorado	4	5	5	26	1,720	40	443	77	331	1	0	0
New Mexico	1	0	1	-------	5	2	24	55	13	0	0	0
Arizona	4	1	1	264	86	122	60	33	47	0	0	1
Utah [3]	5	0	0	34	34	34	37	8	93	0	0	1
Nevada	0	0	0	-------	-------	-------	2	3	3	0	0	0
PACIFIC												
Washington	0	9	8	18	77	4	231	35	180	0	4	6
Oregon	0	1	3	151	24	24	45	18	97	0	0	3
California	14	19	19	374	21	64	1,747	203	953	12	7	23
Total	203	248	261	7,447	21,991	4,744	20,408	7,156	21,511	90	72	284
10 weeks	2,215	2,972	2,972	107,067	62,582	62,582	131,543	48,981	122,429	867	834	2,548
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	8,573	10,538	11,570	150,625	95,557	95,557	166,489	71,868	148,553	1,649	1,806	5,000

[1] New York City only.
[2] Philadelphia only.
[3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year

Telegraphic morbidity reports from State health officers for the week ended Mar. 13, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—Mar. 13, 1948	Week ended—Mar. 8, 1947	Median 1943–47	Week ended—Mar. 13, 1948	Week ended—Mar. 8, 1947	Median 1943–47	Week ended—Mar. 13, 1948	Week ended—Mar. 8, 1947	Median 1943–47	Week ended—Mar. 13, 1948[5]	Week ended—Mar. 8, 1947	Median 1943–47
NEW ENGLAND												
Maine	0	0	0	14	33	33	0	0	0	0	0	0
New Hampshire	0	0	0	6	3	5	0	0	0	0	0	0
Vermont	0	0	0	2	6	12	0	0	0	0	0	0
Massachusetts	0	0	1	149	119	376	0	0	0	3	3	2
Rhode Island	0	0	0	8	12	18	0	0	0	0	0	0
Connecticut	1	0	0	50	45	81	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	4	4	2	307	371	581	0	0	0	1	0	4
New Jersey	1	0	0	89	134	161	0	0	0	4	1	0
Pennsylvania	1	1	1	376	224	468	0	0	0	4	1	3
EAST NORTH CENTRAL												
Ohio	2	0	1	399	447	442	0	0	0	1	0	0
Indiana	2	0	0	72	160	152	0	0	1	1	4	3
Illinois	0	1	1	129	179	265	0	1	0	1	3	1
Michigan[3]	1	0	0	168	122	197	0	0	0	0	1	1
Wisconsin	0	2	0	62	95	319	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	0	0	0	47	79	87	0	0	0	0	0	0
Iowa	0	0	0	34	77	77	0	0	0	0	0	0
Missouri	0	0	0	55	29	100	0	1	0	1	1	1
North Dakota	0	0	0	7	8	16	0	0	0	0	0	0
South Dakota	0	0	0	10	15	17	0	0	0	0	0	0
Nebraska	0	0	0	24	25	40	0	0	0	0	0	0
Kansas	0	1	1	32	76	90	1	5	0	1	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	8	12	12	0	0	0	0	1	0
Maryland[3]	0	0	0	33	39	129	0	0	0	0	0	0
District of Columbia	0	0	0	9	9	36	0	0	0	0	0	0
Virginia	0	0	0	36	38	77	0	0	0	1	1	1
West Virginia	0	0	0	18	6	33	0	0	0	0	0	0
North Carolina	1	2	0	42	46	46	0	0	0	2	2	0
South Carolina	0	0	0	5	5	9	0	0	0	1	2	2
Georgia	0	0	0	28	17	17	0	1	0	2	2	2
Florida	0	2	0	9	11	7	0	0	0	0	1	1
EAST SOUTH CENTRAL												
Kentucky	0	1	0	25	56	57	0	0	0	1	3	0
Tennessee	0	0	0	36	55	55	0	0	0	0	0	1
Alabama	0	3	1	6	12	12	0	0	0	1	1	1
Mississippi[3]	0	1	1	3	9	11	0	0	0	0	1	2
WEST SOUTH CENTRAL												
Arkansas	0	2	0	3	6	6	0	1	1	0	0	1
Louisiana	0	4	1	3	4	10	0	0	0	6	1	1
Oklahoma	0	1	0	11	6	24	1	0	0	1	2	1
Texas	3	3	4	39	60	76	0	0	1	1	6	3
MOUNTAIN												
Montana	1	0	0	17	5	13	0	0	0	0	1	0
Idaho	2	0	0	6	9	9	0	0	0	1	0	0
Wyoming	0	0	0	-------	13	33	0	0	0	0	0	0
Colorado	0	0	0	19	64	53	0	0	0	1	0	1
New Mexico	1	1	0	10	5	5	0	0	0	0	0	0
Arizona	1	0	0	6	3	18	0	0	0	0	0	0
Utah[3]	0	1	0	17	13	64	0	0	0	0	0	0
Nevada	0	0	0	-------	7	4	0	0	0	0	0	0
PACIFIC												
Washington	0	0	1	72	60	60	0	0	0	1	0	0
Oregon	0	0	0	24	34	34	0	0	0	0	0	1
California	4	10	7	66	145	213	0	0	0	4	6	6
Total	25	40	33	2, 591	3, 008	4, 171	2	9	9	40	44	46
10 weeks	317	579	373	23, 302	26, 745	38, 235	31	40	94	[5] 432	437	518
Seasonal low week[4]	(11th) Mar. 15–21			(32d) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	10, 528	25, 376	13, 780	45, 841	53, 431	76, 556	52	94	177	[5] 3, 841	3, 965	5, 144

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately, as follows: Massachusetts 2 (salmonella infection), New York 1, Virginia 1, South Carolina 1, California 1. Delayed report of 50 cases in Oklahoma included in cumulative totals only.

Telegraphic morbidity reports from State health officers for the week ended Mar. 13, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended Mar. 13, 1948							
	Week ended—		Median, 1943-47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Mar. 13, 1948	Mar. 8, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	14	16	24								2
New Hampshire	12	2	1								
Vermont	69	19	31								
Massachusetts	65	117	134		1		1		1		1
Rhode Island	15	12	38								
Connecticut	15	48	49								1
MIDDLE ATLANTIC											
New York	110	196	220	9	1			1			1
New Jersey	77	130	130	1							2
Pennsylvania	114	180	141								7
EAST NORTH CENTRAL											
Ohio	93	162	125	2							2
Indiana	27	42	19				1				
Illinois	67	90	90	3	1		1				16
Michigan [3]	71	232	147	1							9
Wisconsin	76	143	75				1				7
WEST NORTH CENTRAL											
Minnesota	28	12	12	1							1
Iowa	13	26	10				3				13
Missouri	17	24	14								1
North Dakota	15			4							
South Dakota	1		1								4
Nebraska		41	14								4
Kansas	31	5	35								1
SOUTH ATLANTIC											
Delaware		10	2								
Maryland [3]	16	65	41			2					4
District of Columbia	4	2	3	1							
Virginia	45	63	63			61					2
West Virginia	23	27	31								2
North Carolina	96	93	95	2					3		
South Carolina	97	27	58	1	6		1		1	1	
Georgia	8	12	12							1	1
Florida	16	54	18	2	1					2	2
EAST SOUTH CENTRAL											
Kentucky	21	39	32								2
Tennessee	41	27	36	2		2	1		4		1
Alabama	20	50	37								
Mississippi [3]	5			2					1		2
WEST SOUTH CENTRAL											
Arkansas	47	26	26	13		5			2		
Louisiana	3	4	4	4					2		1
Oklahoma	50	5	5	1							3
Texas	484	376	313	11	147	39				9	9
MOUNTAIN											
Montana	8	8	5								
Idaho		4	4				1				1
Wyoming	5	4	4								
Colorado	41	18	25								9
New Mexico	18	9	9	1							
Arizona	96	25	21			21					1
Utah [3]	16	11	26								2
Nevada	4	5	1								
PACIFIC											
Washington	31	39	35	1							1
Oregon	12	2	9								1
California	117	133	183	1			1			1	1
Total	2,254	2,635	2,614	63	157	130	11	1	14	14	117
Same week: 1947	2,635			48	233	375	5	3	27	38	86
Median, 1943-47	2,614			37	287	81	11	0	21	36	[6] 86
10 weeks: 1948	22,390			594	2,561	2,254	91	6	200	150	887
1947	25,028			449	3,461	2,219	67	9	417	460	1,007
Median, 1943-47	23,430			270	2,920	1,099	85	4	208	500	[6] 854

[3] Period ended earlier than Saturday. [6] 3-year median, 1945-47.

Territory of Hawaii: Rabies 0, bacillary dysentery 2, influenza 1, measles 2, scarlet fever 1, whooping cough 10.

WEEKLY REPORTS FROM CITIES*

City reports for week ended March 6, 1948

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	------	0	1	0	4	0	0	2
New Hampshire:												
Concord	0	0	------	0	------	0	0	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	7	0	------	1	437	1	10	0	38	0	0	10
Fall River	0	0	------	1	1	0	0	0	2	0	0	1
Springfield	0	0	------	0	1	0	0	0	1	0	0	------
Worcester	0	0	------	0	------	0	7	0	11	0	1	2
Rhode Island:												
Providence	0	0	------	0	1	0	3	0	6	0	0	------
Connecticut:												
Bridgeport	0	0	------	0	1	0	0	0	1	0	0	------
Hartford	0	0	------	0	------	0	0	0	4	0	0	1
New Haven	0	0	------	0	1	1	0	0	4	0	0	5
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	7	1	7	0	6	0	0	12
New York	10	3	23	2	1,292	3	90	0	77	0	0	33
Rochester	0	0	------	0	------	0	8	0	8	0	0	1
Syracuse	0	0	------	0	27	0	0	0	1	0	0	5
New Jersey:												
Camden	1	0	------	0	17	0	0	0	2	0	0	1
Newark	0	0	1	0	71	1	2	0	10	0	0	3
Trenton	1	0	------	0	1	0	5	0	0	0	0	------
Pennsylvania:												
Philadelphia	2	0	4	1	278	1	15	0	48	0	0	26
Pittsburgh	0	0	1	1	1	3	14	0	20	0	0	9
Reading	0	0	------	0	14	0	1	0	11	0	0	6
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	1	0	33	0	4	0	10	0	0	14
Cleveland	0	0	------	1	5	0	7	0	29	0	1	16
Columbus	3	0	------	0	134	0	3	0	6	0	0	------
Indiana:												
Fort Wayne	0	0	------	0	12	0	0	0	11	0	0	------
Indianapolis	1	0	------	0	143	0	2	0	11	0	0	1
South Bend	0	0	------	0	------	0	0	0	1	0	0	------
Terre Haute	0	0	------	0	13	0	0	0	1	0	0	------
Illinois:												
Chicago	1	0	------	2	720	1	28	0	50	0	2	20
Springfield	0	0	------	0	308	0	1		0	0	0	2
Michigan:												
Detroit	1	0	1	0	193	0	10	0	69	0	0	15
Flint	0	0	------	0	2	0	2	0	3	0	0	------
Grand Rapids	0	0	------	0	390	0	3	0	1	0	0	5
Wisconsin:												
Kenosha	0	0	------	0	118	0	0	0	1	0	0	1
Milwaukee	0	0	------	0	51	0	3	0	14	0	0	6
Racine	0	0	------	0	192	0	0	0	4	0	0	3
Superior	0	0	------	0	24	0	0	0	0	0	0	------
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	41	0	2	0	5	0	0	3
Minneapolis	1	0	------	3	81	1	7	1	10	0	0	3
St. Paul	0	0	------	0	50	0	3	0	5	0	0	1
Missouri:												
Kansas City	0	0	5	0	6	0	8	0	2	0	0	24
St. Joseph	0	0	------	0	------	0	0	0	0	0	0	------
St. Louis	1	0	2	0	123	1	7	0	17	0	0	20

---

* In some instances the figures include nonresident cases.

City reports for week ended Mar. 6, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	3	0	0	0	4	0	0	------
Nebraska:												
Omaha	0	0	------	1	20	0	3	0	0	0	0	1
Kansas:												
Topeka	0	0	------	0	-------	0	0	0	1	0	0	3
Wichita	0	0	------	0	1	0	2	0	1	0	0	3
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	25	0	3	0	5	0	0	1
Maryland:												
Baltimore	1	0	2	0	14	0	7	0	12	0	0	15
Cumberland	1	0	------	0	-------	0	0	0	0	0	0	1
Frederick	1	0	------	0	-------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	159	0	4	0	9	0	1	10
Virginia:												
Richmond	1	1	------	0	1	0	2	0	9	0	0	4
Roanoke	0	0	------	0	1	0	0	0	0	0	0	------
West Virginia:												
Charleston	0	0	------	0	-------	0	2	0	0	0	0	1
Wheeling	0	0	------	0	4	0	0	0	1	0	0	------
North Carolina:												
Raleigh	0	0	------	0	-------	0	0	0	0	0	1	5
Wilmington	1	0	------	0	-------	0	1	0	1	0	0	------
Winston-Salem	0	0	------	0	-------	0	1	0	0	0	0	------
South Carolina:												
Charleston	1	0	45	1	-------	0	0	0	2	0	0	3
Georgia:												
Atlanta	0	0	3	0	2	0	2	0	9	0	0	1
Brunswick	0	0	------	0	-------	0	0	0	0	0	0	2
Savannah	0	0	------	0	-------	0	0	0	0	0	0	2
Florida:												
Tampa	0	0	------	0	24	0	2	0	2	0	0	------
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	4	1	127	1	6	0	2	0	0	2
Nashville	0	0	------	0	-------	0	3	0	1	0	0	------
Alabama:												
Birmingham	0	0	3	1	4	0	4	1	1	0	0	1
Mobile	0	0	49	0	-------	1	2	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	4	0	7	0	2	0	0	0	0	------
Louisiana:												
New Orleans	0	0	34	2	5	1	10	0	0	0	1	2
Shreveport	0	0	------	0	-------	0	3	0	0	0	0	------
Oklahoma:												
Oklahoma City	0	0	16	0	2	0	6	0	2	0	1	2
Texas:												
Dallas	3	0	------	1	57	0	4	0	3	0	0	1
Galveston	0	0	------	0	-------	0	2	0	1	0	0	------
Houston	1	0	------	0	4	0	9	0	1	0	0	------
San Antonio	1	0	------	0	7	0	9	0	3	0	0	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	1	0	0	0	0	0	0	2
Great Falls	0	0	------	0	5	0	1	0	0	0	0	------
Helena	0	0	------	0	-------	0	0	0	0	0	0	------
Missoula	0	0	------	0	-------	0	0	0	0	0	0	------
Colorado:												
Denver	0	0	4	0	262	0	2	0	3	0	0	15
Pueblo	0	0	------	0	8	0	1	0	6	0	0	10
Utah:												
Salt Lake City	1	0	------	0	11	0	1	3	4	0	0	------

City reports for week ended Mar. 6, 1947—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	1	12	1	9	0	16	0	0	5
Spokane	0	0	1	0	0	0	4	0	1	0	0	------
Tacoma	0	0	------	0	52	0	0	0	1	0	0	------
California:												
Los Angeles	3	0	21	2	140	1	10	0	28	0	0	14
Sacramento	0	0	------	0	1	0	1	0	7	0	0	------
San Francisco	0	0	36	0	218	0	7	0	4	0	0	2
Total	44	4	260	22	5,966	19	378	5	644	0	8	360
Corresponding week, 1947 [1]	83	------	247	26	1,483	------	411	------	792	0	24	659
Average 1943-47 [1]	72	------	207	[2] 29	[3] 5,168	------	[2] 443	------	1,508	1	10	625

[1] Exclusive of Oklahoma City.
[2] 3-year average, 1945-47.
[3] 5-year median, 1943-47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (latest available estimated population, 34,566,200)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	18.3	0.0	0.0	5.2	1,155	5.2	54.9	0.0	186	0.0	2.6	55
Middle Atlantic	6.5	1.4	13.4	1.9	791	4.2	65.7	0.0	85	0.0	0.0	44
East North Central	3.6	0.0	1.2	1.8	1,422	0.6	38.3	0.0	128	0.0	1.8	50
West North Central	4.0	0.0	13.9	8.0	647	4.0	63.7	2.0	90	0.0	0.0	115
South Atlantic	9.9	1.7	82.7	1.7	381	0.0	39.7	0.0	83	0.0	3.3	74
East South Central	0.0	0.0	330.5	11.8	773	11.8	88.5	5.9	24	0.0	0.0	18
West South Central	12.7	0.0	137.2	7.6	208	2.5	114.3	0.0	25	0.0	5.1	15
Mountain	8.3	0.0	33.0	0.0	2,371	0.0	41.3	24.8	107	0.0	0.0	223
Pacific	4.7	0.0	91.7	4.7	669	3.2	49.0	0.0	90	0.0	0.0	33
Total	6.7	0.6	39.3	3.3	902	2.9	57.2	0.8	97	0.0	1.2	54

Dysentery, amebic.—Cases: New York 2; Philadelphia 1; Chicago 2; Baltimore 1; Brunswick 1; New Orleans 2; Oklahoma City 1; Los Angeles 4.

Dysentery, bacillary.—Cases: Worcester 1.

Dysentery, unspecified.—Cases: San Antonio 3.

Tularemia.—Cases: Memphis 1; New Orleans 1.

DEATHS DURING WEEK ENDED MARCH 6, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Mar. 6, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	9,788	10,206
Median for 3 prior years	9,885	------------
Total deaths, first 10 weeks of year	103,504	100,149
Deaths under 1 year of age	671	856
Median for 3 prior years	607	------------
Deaths under 1 year of age, first 10 weeks of year	7,087	8,233
Data from industrial insurance companies:		
Policies in force	71,199,020	67,329,750
Number of death claims	15,519	12,818
Death claims per 1,000 policies in force, annual rate	11.4	9.9
Death claims per 1,000 policies, first 10 weeks of year, annual rate	10.1	9.8

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended February 21, 1948.—During the week ended February 21, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox	--------	41	1	164	432	57	23	51	83	852
Diphtheria	--------	--------	--------	26	1	--------	--------	6	4	37
Dysentery, amebic	--------	--------	--------	3	--------	--------	--------	--------	--------	3
Encephalitis, infectious	--------	--------	--------	1	--------	--------	--------	--------	--------	1
German measles	--------	--------	--------	20	34	--------	1	13	14	82
Influenza	--------	105	--------	-----	47	3	--------	--------	71	226
Measles	--------	1	--------	1,097	1,310	5	9	28	126	2,576
Meningitis, meningococcus	--------	--------	--------	2	1	--------	1	--------	2	6
Mumps	--------	18	3	318	223	56	31	32	25	706
Scarlet fever	--------	3	--------	47	92	3	2	6	4	157
Tuberculosis (all forms)	--------	3	4	81	29	25	19	7	75	243
Typhoid and paratyphoid fever	--------	--------	--------	8	--------	--------	--------	--------	--------	8
Undulant rever	--------	--------	--------	3	2	--------	--------	--------	1	6
Venereal diseases:										
Gonorrhea	--------	14	6	114	59	26	23	35	71	348
Syphilis	1	4	4	56	48	14	7	7	22	163
Whooping cough	--------	2	1	36	23	6	7	32	5	112

Jamaica

Notifiable diseases—4 weeks ended February 28, 1948.—During the 4 weeks ended February 28, 1948, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chickenpox	4	12	Puerperal sepsis	--------	1
Diphtheria	4	--------	Tuberculosis, pulmonary	61	63
Dysentery, unspecified	1	--------	Typhoid fever	8	73
Erysipelas	2	--------			

SWITZERLAND

Notifiable diseases—October–December 1947.—During the months of October, November, and December 1947, cases of certain notifiable diseases were reported in Switzerland as follows:

Disease	October	November	December	Disease	October	November	December
Cerebrospinal meningitis	6	7	3	Mumps	73	88	190
Chickenpox	177	283	585	Paratyphoid fever	6	13	4
Diphtheria	665	643	663	Poliomyelitis	94	31	17
Dysentery, epidemic	16	17	92	Scarlet fever	786	591	556
Encephalitis, lethargic	1	-------	-------	Tuberculosis	357	279	334
Hepatitis, epidemic	53	52	51	Typhoid fever	9	7	4
Influenza	65	76	118	Undulant fever	14	6	14
Malaria	-------	1	-------	Whooping cough	333	329	289
Measles	403	351	490				

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Smallpox

Burma—Rangoon.—For the week ended February 28, 1948, 45 cases of smallpox were reported in Rangoon, Burma.

China—Shanghai.—For the week ended February 28, 1948, 165 cases of smallpox were reported in Shanghai, China.

India—Calcutta.—For the week ended February 28, 1948, 414 cases of smallpox were reported in Calcutta, India.

Indochina (French)—Cochinchina—Saigon.—For the week ended February 28, 1948, 12 cases of smallpox were reported in Saigon, Cochinchina, French Indochina.

Korea.—For the week ended September 6, 1947, 1 case of smallpox was reported in southern Korea, and for the week ended September 13, 1947, 1 case was reported in Seoul, Korea.

Typhus Fever

Korea.—Typhus fever has been reported in southern Korea as follows: Week ended September 6, 1947, 2 cases were reported in southern Korea; week ended September 13, 1947, 4 cases, including 2 cases in Seoul, were reported.

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948
For sale by the Superintendent of Documents, Washington 25, D. C.
Price 10 cents. Subscription price $4.00 a year

U. S. GOVERNMENT PRINTING OFFICE: 1948

26 MAY 1948

Public Health Reports

VOLUME 63 APRIL 9, 1948 NUMBER 15

IN THIS ISSUE

New Surgeon General Takes Office

The Road Ahead in Public Health

Control of Trichinosis

U.S. PUBLIC HEALTH SERVICE
1798

CONTENTS

Page

Dr. Parran is succeeded by Dr. Scheele 469

The Public Health Service under leadership of Dr. Parran 470

The road ahead in public health. Dr. Leonard A. Scheele 472

Control of trichinosis. Report by the Committee on Public Health Relations, The New York Academy of Medicine 478

Health of arc welders in steel ship construction. Waldemar C. Dreessen, Hugh P. Brinton, Robert G. Keenan, Thalbert R. Thomas, Edwin H. Place and James E. Fuller. A review 488

INCIDENCE OF DISEASE

United States:
  Reports from States for week ended March 20, 1948, and comparison with former years 490
  Weekly reports from cities:
    City reports for week ended March 13, 1948 494
    Rates, by geographic divisions, for a group of selected cities 496
  Territories and possessions:
    Panama Canal Zone—Notifiable diseases—January 1948 497
Deaths during week ended March 13, 1948 497
Foreign reports:
  Canada—Provinces—Communicable diseases—Week ended February 28, 1948 498
  Cuba—
    Habana—Communicable diseases—4 weeks ended February 28, 1948 498
    Provinces—Notifiable diseases—4 weeks ended February 28, 1948 498
  Finland—Notifiable diseases—January 1948 499
  Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—
    Plague 499
    Smallpox 499
    Typhus fever 500
    Yellow fever 500

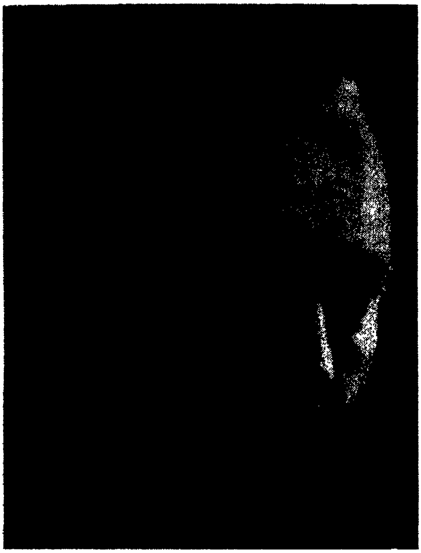
26 MAY 1948

Public Health Reports

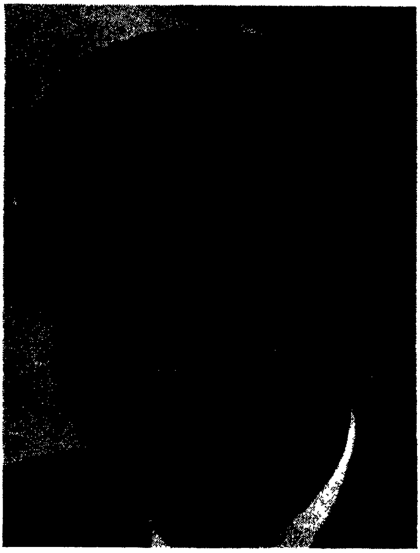
Vol. 63 • APRIL 9, 1948 • *No. 15*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

DR. PARRAN IS SUCCEEDED BY DR. SCHEELE



DR. THOMAS PARRAN



John Henderson Studios.

DR. LEONARD A. SCHEELE

Dr. Leonard A. Scheele took over his official duties as Surgeon General of the United States Public Health Service on April 6. President Truman nominated him for this post on February 12 and the appointment was confirmed by the Senate on February 25. Commenting on his successor, Dr. Thomas Parran said:

"Dr. Scheele is one of the outstanding figures in public health in this country. He possesses both the professional and personal qualifications to be a great Surgeon General. I wish for him long years of useful public service in this responsible position."

Dr. Scheele, 40, previously Assistant Surgeon General and Director, National Cancer Institute, has devoted his entire professional life to public health.

He assumed his former position in July 1947, after serving as Assistant Director, National Cancer Institute since 1946. During the past 2 years, he also has been concerned with development of plans for the Service's 500-bed clinical research hospital.

Dr. Scheele's wartime services included a year (1942–43) in Washington as Chief, Field Casualty Section, Medical Division, United States Office of Civilian Defense; and over 2 years (1943–45) in Europe on loan to the United States Army. He administered all public health and welfare operations in Italy, and later, with Supreme Headquarters, Allied Expeditionary Forces, administered a similar program for all of northwest Europe. His work won him three military decorations: Legion of Merit, Typhus Medal and French Order of Public Health.

He began specialization in 1937 as a Special Cancer Fellow at Memorial Hospital, New York, N. Y. On completion of 2 years of studies, he was assigned to the National Cancer Institute as Officer in Charge, National Cancer Control Program, 1939–42.

Dr. Scheele entered the Public Health Service in 1934. As Assistant Quarantine Officer, he served a year each in San Francisco and Honolulu. In 1936–37, he was Health Officer, Queen Anne's County, Md.

He received his A. B. from University of Michigan in 1931, his B. S. in medicine in 1933 and his M. D. in 1934, both from Wayne University, Detroit.

THE PUBLIC HEALTH SERVICE UNDER LEADERSHIP OF DR. PARRAN

Dr. Thomas Parran, who has devoted more than 30 years of his professional life to the Public Health Service, was first appointed Surgeon General in 1936.

At that time, Service activities were confined primarily to operation of Marine hospitals, to interstate and foreign quarantine and to research on a limited scale.

Today, Public Health Service responsibilities encompass the wide field of preventive medicine which is moving into the study of man and his reaction to his total environment, both physical and mental.

Expansion of the Service was made possible with the passage in 1935 of the Social Security Act which provided Federal grants-in-aid for general public health work.

Dr. Parran has been one of the chief proponents of the principle of limited grants to strengthen not only local and State public health services, but also for expansion of research in private and public nonfederal institutions throughout the country.

To enable Public Health Service research workers to study human cases, he inaugurated plans for a clinical research hospital which is to be added to the National Institute of Health.

He also has consistently encouraged support of voluntary health and civic organizations in behalf of improved public health services.

Even before he became Surgeon General, Dr. Parran was a leading proponent of the principle of advisory councils of outstanding scientists to assist in the administration of the research program. This has proved so successful a policy that similar provisions were written into the National Cancer Institute Act, Mental Health Act, and Hospital Survey and Construction Act.

Backed by the confidence of Congress, Dr. Parran has been largely responsible for initiating these programs in the Public Health Service during his term of office:

1. Strengthening of the research program of the National Institute of Health and increasing the support of research projects in nonfederal institutions.
2. Development of a national research and control program in cancer.
3. Development of national venereal disease control through aid for States.
4. Development of a national tuberculosis control program to augment voluntary activities.
5. Administration of the National Mental Health Act to stimulate research, training and State programs of control.
6. Administration of the Hospital Survey and Construction Act to make possible the beginning of a national network of hospital and public health facilities.
7. Development and administration of wartime Cadet Nurse Corps to prevent the collapse of civilian nursepower.
8. Organization of the Communicable Disease Center, Atlanta, Georgia, which cooperates with State and local health departments in the study and prevention of communicable diseases.

Dr. Parran has represented the United States at many international health and related conferences. He will continue to be this Government's member on the Interim Commission of World Health Organization.

THE ROAD AHEAD IN PUBLIC HEALTH

By Dr. Leonard A. Scheele, *Surgeon General, United States Public Health Service*

No Surgeon General of the United States Public Health Service has taken the solemn oath of office under such fortunate circumstances as attend my entering upon that assignment today. None, I hope, has taken office with a deeper sense of responsibility and pride than I feel today.

This year, 1948, is the one hundred and fiftieth anniversary of the Public Health Service. Our organization is stronger and better equipped to serve the Nation, richer in the confidence of the American people and their Representatives in Congress, broader in its vision of service, than ever before in its long history. The Nation knows—but no group is more sensibly aware than we of the Public Health Service—that we owe much of that strength, enrichment, and vision to our great leader of the past 12 years—Dr. Thomas Parran. As one of the many officers to whom he has given opportunities for experience and leadership, I accept, with a real sense of humility, the torch from his hand and pledge to hand it on with its flame of service undiminished.

To be given the leadership of the Public Health Service with its rich heritage of service and accomplishment, is more than an honor: it is an inspiration and a challenge. Today, nearly 20,000 men and women are devoting their lives to the Service; their work and their devotion to our common objectives inspire the confidence with which I undertake the task of leadership. The heritage created by our predecessors challenges all of us to preserve its high traditions and to seek its continuing enrichment in every opportunity offered us for giving more and better service to the Nation.

We are further inspired and challenged by the yearning of the American people for health. At no time in our history has the desire for meaningful values and new life-goals been so intense; and health is the first value and the first goal of life. The desire for health is reflected by the growing public demand for better health services, by increased congressional support of the programs of the Public Health Service and by numerous new proposals, which the Congress is now considering, for the solution of some of our most urgent problems.

Finally, and I believe most significantly, the desire of the Nation for health is reflected by a new understanding on the part of professional and civic leaders, that they must work more closely with each other in planning and operations to improve health and medical services of all types. As Surgeon General of the Public Health Service, I consider it to be one of my first duties and privileges to foster cooperation between this organization and our colleagues in the

Nation's professional societies and faculties, in the voluntary and philanthropic organizations interested in health and medical service and in other Federal, State, and local agencies.

The pattern of cooperation which was established in the basic law of the Public Health Service[1] has served the Nation efficiently in strengthening and expanding medical research, professional training, and public health services. The primary factor in these programs is the provision of financial assistance: for research—grants-in-aid to public and nonprofit private institutions and to individual scientists; for professional training—fellowships and clinical traineeships to individuals, and grants to State health authorities for training their employees; for general and special public health programs, including hospital construction—grants to legally responsible State agencies. The Public Health Service will continue to seek implementation of its financial-aid programs through adequate appropriations, and we will endeavor to increase and strengthen other elements of the cooperative programs, such as consultant and technical services, joint planning, and coordination of our programs in the interest of more efficient and effective administration.

The policy of the Public Health Service in the past has been to advance national health by the processes of demonstration, education, concrete help, and leadership. Our existing laws support that policy, and State agencies and private institutions which have participated in our programs, have concrete proof that the actions of the Service are in strict conformity with our policy and with the law. The independence of private institutions and the sovereign authority of the States for the initiation and conduct of their programs have been consistently respected by the Public Health Service; and this policy will be maintained under my administration. I anticipate acceptance of increased responsibility on the part of all the Nation's health resources—industrial, charitable, private, professional, and governmental—for the health of the American people. It shall be my constant endeavor, aided by my colleagues, to keep the Public Health Service always alert to the Nation's needs and to provide to all cooperating organizations the highest quality of service that we can render.

The oldest program of the Public Health Service—medical and hospital care for our various groups of beneficiaries—commands the major portion of our clinical and auxiliary manpower. To the men and women who operate our far-flung network of hospitals and clinics, thousands of Americans owe the precious gift of sympathetic care in illness and restoration to health. The Public Health Service owes its medical and hospital staffs a debt of gratitude for devotion to duty, often in extremely difficult situations. The Service will seek to strengthen their hands in the provision of services to their patients, and to improve their opportunities for continued training and advancement in their professions.

---

[1] Public Health Service Act of 1944, as amended.

By increasing teamwork among all those engaged in major programs of the Service, I believe we can mutually benefit from each other's strengths and accomplishments and thus give even more valuable service to the Nation.

The advances already made in the administration of the national quarantine laws have taught us valuable lessons. We now know that a modern, streamlined quarantine service is not a barrier but an aid to the peaceful intercourse of nations, and to international cooperation in health protective measures. The Public Health Service will continue to seek and apply effective methods in the administration of the quarantine service.

The United States has been a leader in the development of plans for a world health organization, and the Public Health Service has played an important part in that development. The Service stands ready to make its contribution to international health under the laws of the Nation. So far, the United States has not joined the 24 United Nations who formally accepted the covenant of the World Health Organization.

We are living in an era of rapid social change and scientific progress. The speed and nature of change in contemporary life have a striking effect upon the relative importance of health problems. A half-century ago, our principal health problem was the conquest of communicable diseases. Today, new problems, chiefly those related to the health of an older population, confront us. Thus, as the health needs of the Nation change and shift, the programs of the Public Health Service must be kept flexible so that at all times our efforts may be focused upon those problems which chiefly affect the Nation's well-being and which chiefly concern the American people. Within the framework of its legal responsibility, the Service will continue to seek the means to strengthen all appropriate resources of the Nation in solving those problems.

No one organization, no one of our great American institutions—private enterprise, voluntary public service—can alone solve the major health problems of today. We must all consider the Nation's health our individual and our mutual responsibility. As I see the national health needs at this time, certain problems should have priority in our efforts to seek solutions.

We have a great deal of unfinished business in the public health field. Communicable diseases, both chronic and acute, which still take approximately 100,000 lives annually, could be eliminated if we worked more diligently with the tools at hand. We have the medical and public health means; we have organized Federal-State cooperative programs for applying the means. There is no excuse for failure to control venereal diseases, tuberculosis, malaria, whooping cough, diphtheria, typhoid fever, the dysenteries and several other acute infections I could mention. The conquest of communicable diseases is a clear responsibility of local, State, and Federal health agencies. It is imperative that we clinch our victory in this field, for other more difficult tasks await willing hands.

A part of our unfinished business—and a primary cause of lag in the conquest of old diseases—is the organization, staffing, and efficient operation of local health units. The Public Health Service, through its pattern of State aid, stands ready with a large proportion of its resources, to assist in covering the United States with full-time efficient local health services, a task approved by all professional organizations. The organization of local health units is a clear responsibility of local and State governments. Legislation now before the Congress would, if enacted, greatly increase the Federal contribution to the organization of local health services throughout the country, and to the training of personnel for staffing them.

The American people have not yet seriously considered one of their greatest personal and national health needs: the need for healthy maturity. The prediction that by 1970, one in every 10 Americans will be 65 years of age or older, has not been understood in all its implications. When the Public Health Service was established 150 years ago, the average American lived only 40 years; today, he lives more than 65 years. Yet we have not even attempted to define what we think healthy maturity should be. We find ourselves faced, instead, with an enormous personal and national burden of disease in the adult population, the most productive element of our society. It is possible that we shall not be able clearly to define healthy maturity until we learn more about the chronic degenerative diseases and until we attempt to apply in the entire adult population our knowledge of these diseases. It was not until we had made considerable progress in the control of childhood diseases that we could undertake the important study of the whole child and thus come to an understanding of healthy childhood. Child health is now a positive, defined objective of this country—even though we have not yet attained health for all our children. In our need for healthy maturity, we have only just started to apply widely our knowledge of cancer and to intensify our search for better means with which to detect and treat malignancies. We have barely started to explore the cardiovascular diseases.

Research and application still lag in other major causes of death and ill-health among adults; cerebral hemorrhage, kidney diseases, diabetes, arthritis, and rheumatism. Study of the healthy adult should accompany our investigation of the diseases to which he is susceptible. Our aim should be not only freedom from disease, but healthy maturity.

Mental health is known to be one of the most important requirements for a healthful, happy life at all ages. The National Mental Health Program established in the Public Health Service 2 years ago has met with unusual difficulties. Supported by the Nation's leading psychiatrists and experts in related fields, our efforts still languish in the nation-wide shortage of trained personnel and facilities, and in the lack of understanding on the part of the public that mental illness, with its incipient manifestations, is the most widespread, serious ailment of our time. It is my sincere hope that the American people will recognize the seriousness of this problem and will seek the means for mental health which, science assures us, will result from united efforts to apply psychiatric knowledge to our personal and community problems.

The search for new knowledge in the medical sciences is being expanded throughout the United States. The Public Health Service is proud of its share in fostering that expansion and in the work now being done in our own laboratories and hospitals. Our institutes for general research, for research in cancer and mental disease, in a few years' time will be, I hope, the finest center in the world for experimental and clinical investigations of the major causes of disability and death. We shall not relax our efforts to expand and refine knowledge of the infectious diseases. Recent achievements by Public Health Service investigators are proof of our determination to intensify the exploration of baffling problems in bacteriology.

The Nation's investments in research have produced a body of knowledge which, if fully applied to the needs of all the people, would advance human health immeasurably. I have mentioned the lag in the application of some of this knowledge, even though the effective means for its application through community health organization is equally well known. One of the chief causes of lag in other fields is lack of agreement as to the most effective means for bringing scientific knowledge and skills directly to the people who need them. It is my earnest desire that the Public Health Service shall contribute fully to the solution of these perplexing problems. I believe that we can do so by cooperating with the professions, institutions, and agencies which provide health and medical care, in the study and demonstration of more effective methods for the organization and provision of services.

The health of the American people and their health resources cannot and must not become a monopoly—either of governments, private enterprise, or charitable organizations. Each of these great institutions has made incalculable contributions to American health. The constituent groups and organizations within them must endure and grow in wisdom, strength, and efficiency.

The crisis in the professional schools of the Nation is the most serious problem which faces the medical and health professions today. Unless and until the crisis is resolved, the Nation will be hampered in all its efforts to increase its health resources and to improve the health of the people. The President's Scientific Research Board and other serious students of the problem have pointed to the financial straits into which the medical and other professional schools have fallen. These training centers which produce our doctors, dentists, nurses, research scientists, and other essential health personnel are national assets, vital to our personal and national well-being. Professional education has been established in this country on high standards and on a system which allows for growth, change, and improvement. The present high standards must be maintained and raised as rapidly as science, facilities, and funds permit. Expansion of educational facilities is essential if the demand for trained personnel is to be met; but expansion must be based upon demonstrated needs and upon the abilities of the schools to meet those needs.

Under existing laws, the Public Health Service will do all in its power to alleviate today's shortage of qualified personnel through its research fellowships and clinical trainee programs. Grants-in-aid are already available to qualified institutions for the construction of laboratory and clinical research facilities for the study of cancer. I hope that in the future we may be able to extend the same type of assistance in other research fields. Public Health Service funds may also be used in research projects to provide beds in nonfederal hospitals for clinical research; we shall encourage and assist the establishment of more research beds throughout the country as one means of expanding both the search for new knowledge and the training of personnel.

The Public Health Service must be particularly responsive to the needs of the Nation's schools of public health. The shortage of trained public health personnel of all types is one facet of the total problem of professional education, but it is one which involves the efficient staffing of our organization as well as many State and local health departments.

The present low salary levels and inadequately supported administration in our health organizations also are barriers to the recruitment of able young men and women to the service of the Nation's health. Like America's teachers, scientists, artists, and other creative workers, America's health workers have not been assigned their true value—either *economic* or *functional*—in our *contemporary* civilization. Yet, they represent the enduring, vital values which make life worth living and a nation spiritually and physically alive! The Public Health Service has a responsibility to give full support to improved personnel practices and to improved compensation for public health personnel throughout the country. Public health work must be made as attractive economically as it is spiritually to those who adopt it as a career.

In this critical era, the public health and medical professions are faced with great and challenging responsibilities which call for our fullest mental and physical energies. I believe that we shall meet our responsibilities to the American people, to our professions, and to ourselves with that combination of intellectual integrity and creative imagination which has characterized the great men and women of medicine and public health. To my colleagues in the Public Health Service, to our Advisory Councils and consultants, and members of the health professions everywhere, I express my desire and firm determination to work with you and for you, as Surgeon General and as colleague, while we strive together in our tasks of service. And to the American people, I pledge my best efforts for the health of every person in the land.

CONTROL OF TRICHINOSIS

REPORT BY THE COMMITTEE ON PUBLIC HEALTH RELATIONS, THE NEW YORK ACADEMY OF MEDICINE[1]

INCIDENCE OF TRICHINOSIS

Necroscopic examination of diaphragm material from 5,313 persons in 37 States and the District of Columbia showed an incidence of 16.1 percent of trichinous infection, according to a study (*14*) made by the National Institute of Health over several years. The specimens were derived from 3,000 hospital patients in Washington, D. C., and 5 eastern seaboard cities; 200 from States in which clinical trichinosis had never been reported; and 283 from victims of sudden death outside of hospitals or who had been in hospitals for less than 24 hours. The rest included 1,125 specimens selected at random from hospitals chosen on a chance basis; 295 from persons who had lived on farms or in villages; 200 from orthodox and unorthodox Jews; 200 from the State of Washington and 10 from Oregon. Omitting the Jewish series, in which there was only one positive case, the rate of infection was 16.7 per 100 cases and was nearly uniform regardless of geographical or environmental factors (*14*).

---

[1] Prepared by E. H. L. Corwin, Ph. D. and Lois Stice for a subcommittee consisting of Dr. Haven Emerson, Dr. Wilson G. Smillie, and Dr. Maximin De M. Touart.

The high incidence of trichinous infection in these patients in whom clinical trichinosis had not been diagnosed suggests that many cases are never recognized and that many persons suffer only mild illness that does not come to medical attention. Ober (*9*) in a review of 287 cases seen in Massachusetts during the 10-year period 1936–45 stated that in 70 thoroughly studied cases the disease had first been misdiagnosed. Diagnoses made before trichinosis was suspected included grippe, acute nephritis, chronic nephritis, chronic rheumatic fever, pyelonephritis, gastroenteritis, staphylococcal infection, food poisoning, and poliomyelitis. Other diseases for which trichinosis may be mistaken are typhoid fever, angioneurotic edema, meningitis, tetanus, and acute sinusitis.

Evidence presented in 1940 before a special commission of the New York State Legislature during an investigation (*8*) indicated that in the preceding 10 years, 1,403 cases had been reported in the State of New York and that 608 of these were in New York City. According to more recent information, 1,075 cases were reported in New York City between 1934 and 1944. An outbreak of 84 cases in February and March, 1945, was described by Shookhoff, Birnkrant, and Greenberg (*11*). While the morbidity rate has not been definitely determined, the mortality rate of clinically recognized trichinosis is from 5 to 6 percent.

The average incidence of trichinous infection in all hogs in the United States has been estimated to be approximately 1.5 percent. It is 5.7 percent in garbage-fed hogs and 0.95 percent in hogs fed mainly on forage, grain, and other feeds. The greatest source of infection in hogs is said to be infected pork scraps fed to them in garbage. On the basis of the average incidence, Gould (*5*) estimated that the average American during his lifetime would probably consume nearly 200 meals of pork containing trichinae. Infection may occur if the trichinae are viable in only one of these servings of pork.

In addition to the mortality and morbidity from this disease among human beings, our foreign trade has been affected at times, since pork from this country has been excluded from several European countries because of its heavy infection with trichinae. Germany in 1880 and 1883 issued specific decrees prohibiting importation of pork from the United States. In 1891 the United States adopted microscopic inspection of pork intended for foreign export, but in spite of this, Germany began to reinspect and after a few years refused to accept further certification of inspection from this country. The United States Department of Agriculture states, however, that European countries have for many years accepted pork from this country on the basis of our certification; France makes a special requirement that fresh pork sent to that country be frozen to destroy any possible live trichinae.

The foregoing facts prove that trichinosis is a significant public health as well as an economic problem. A subcommittee of the Committee on Public Health Relations of The New York Academy of Medicine, appointed to inquire into the situation, conferred with representatives of the United States Public Health Service, the United States Department of Agriculture, the American Society of Refrigerating Engineers, and Dr. Donald L. Augustine of Harvard University, who has conducted research on the effects of low temperature on trichinae. In addition, the information collected by the New York State Trichinosis Commission at its hearings in 1940 was reviewed.

RELATION OF TRICHINOSIS TO MEAT INSPECTION

Federal inspection of meat as practiced at present does not guarantee freedom from trichinae in fresh pork and pork products ordinarily cooked by the consumer. Only about 70 percent of the pork consumed in the United States is produced in plants under Federal inspection (*4*), and of that amount only the part that is intended for consumption without further cooking may be considered to be free from trichinae. On fresh pork or cured pork ordinarily cooked by the consumer, the legend "U. S. Inspected and Passed" means that the pork has been inspected in the same manner as all other meat intended for sale in interstate commerce and that it is not necessarily free from trichinae. Federal inspection is required only for pork products that move in interstate commerce, and pork consumed in the State where it is produced may or may not undergo Federal inspection. The hearings of the New York State Trichinosis Commission revealed there are several hundred butchers in the State operating small slaughterhouses where there is little, if any, inspection or supervision. Some cities have their own meat-inspection service, but at most up-State slaughterhouses the meat products are under no inspection from any source.

METHODS OF CONTROL

Several methods of preventing transmission of trichinae to human beings have been advocated. The most effective are: (1) Microscopic inspection of pork, (2) boiling of garbage fed to hogs, and (3) processing of pork by some acceptable method—heating, curing, or freezing. It is apparent that none of these methods has been applied consistently or strictly enough to lower the prevalence of the infection.

Microscopic examination.—According to Gould, microscopic inspection has been used in some countries with good effect (*5*). The principal objections to this method are: (1) The procedure is costly; (2) trichinae may not be detected, particularly in hogs less than 1 year old; (3) trichinae may not be found in the particular tissue specimen examined and yet may be present in other parts of the same animal; and (4) the public may acquire a false sense of security in eating raw or inadequately cooked pork if it is marked as having passed microscopic examination. Even if microscopic inspection were practiced by the Federal Government, nearly one-third of the pork produced in the country would not be subjected to inspection.

Boiling of garbage.—It is generally agreed that hogs fed principally on garbage are the chief source of trichinous infection. Any regulation requiring the feeding of grain alone would appear to be impossible of enforcement in the United States, even if grain were available in adequate amount for the purpose. Moreover, even grain-fed hogs would be infected in the pens of the slaughtering plants if they were fed on offal as they reportedly are in many instances.

Boiling of garbage fed to hogs appears to be a relatively effective method of control in Canada and England, but is regarded by many as impractical in this country because of enforcement difficulties. The United States Public Health Service, however, for many years has advocated this method (*7, 12, 13*). In 1938, Dr. Maurice C. Hall, late Chief of the Division of Zoology, declared that in spite of all objections or statements to the contrary, garbage feeders can, and in many places do, cook garbage (*7*). He commented further that "Whether every detail of cost, feed values and other items meets with the entire approval of everyone concerned or interested, is a minor matter compared with the public health as affected by garbage-fed hogs, of which about 5 percent are trichinous."

In a study of municipal garbage-disposal methods as related to trichinosis, Wright (*12*) declared that although most of the municipalities had provided protection against many diseases spread through food and water, in the case of trichinosis they were not only failing to provide safeguards, but were contributing to the spread of infection by permitting the use of garbage for hog-feeding. Emphasizing that the economic aspect was not the factor of prime importance, Wright pointed out that "With such things as the use of night soil as fertilizer, we have long since disregarded the economic factor in favor of benefits to community health."

The American Public Health Association, through its governing council, adopted a resolution in 1938 urging that local and State health officials "take active steps to encourage the use of methods of garbage disposal other than disposal by feeding to swine, or to encourage the cooking of municipal garbage before its consumption by swine, as a health measure for the protection of the citizens of the municipality." The American Journal of Public Health in 1940 directed attention editorially to the problem and stated that the reasons for lack of protection in the cities are almost entirely commercial, since some cities maintain hog farms of their own, and in other cities persons engaged in the business have brought pressure to bear against the passage of legislation designed to protect the public effectively against the dangers of raw pork (*10*).

Veterinarians also have recommended the boiling of garbage as a solution to the problem of trichinosis. Dickey (*3*) in 1943 urged the American Veterinary Medical Association to exercise its influence to have laws passed by the States to prohibit what he called "the unpardonable, but highly mercenary practice of feeding hogs uncooked garbage containing pork scraps."

According to Dickey, large-scale garbage feeders have complained that a requirement for boiling garbage would impose discrimination on them unless the law also applied to farmers who feed home-produced swill to swine. Dickey compared such complaints to the early fears on the part of slaughterers that Federal meat inspection would put them out of business. He commented:

> It is firmly believed that the pangs which the feeders of uncooked garbage experience every time there is public expression in favor of laws requiring the cooking of garbage fed to hogs are but travail pains which will completely disappear when the laws are finally born.

Another objection often raised is that boiled swill is not palatable to hogs. There appears to be a difference of opinion on this point. Some authorities told the New York State Trichinosis Commission that hogs would eat cooked garbage, but it was the opinion of most garbage feeders that it was not so palatable as ordinary garbage. On the other hand, evidence from Canada indicates that there were no objections on that score from Canadian hog raisers. Dr. Wright of the United States Public Health Service informed the subcommittee that experiments at the Maryland Agricultural Experiment Station in 1914 had demonstrated that boiling made no difference in the amount of garbage eaten by hogs.

The cost of processing garbage has been investigated by both the United States Public Health Service and the Bureau of Animal Industry of the United States Department of Agriculture. Their statements to the New York State Trichinosis Commission in 1940 indicated that the cost of equipment varied from $10 for an open kettle sufficient for the feeding of 12 hogs to $200 for an upright boiler suitable for 200 hogs. A system large enough to prepare feed for 800 hogs cost $640. The operating cost at that time ranged from 90 cents a ton in Canada to $3.50 a ton in Portland, Oreg. It was pointed out that a large part of the cost was probably represented by the labor involved in removing inedible objects from the garbage.

The Canadian Department of Agriculture furnished hog-raisers with mimeographed directions for building a cooker from a discarded boiler at a cost of from $25 to $60. On some Oregon ranches cooking is done in vats of Douglas fir; the vats cost about $70, while the steam boiler and other necessary equipment cost between $600 and $700, according to a statement by Dr. Wright to the New York State Trichinosis Commission. Small scale feeders have used inexpensive steel oil drums set in a brick furnace.

Pork Processing, with Special Reference to Freezing

Gould (*4*, *5*) advocated Federal, State, and local regulations requiring that all pork be processed. He expressed the opinion that if all pork were processed, trichinosis would be quickly eliminated from hogs, since they acquire the infection principally from eating pork scraps in garbage.

A less sweeping proposal would extend the requirements for processing to cover products which usually are cooked, but are sometimes eaten raw or inadequately cooked. A representative of the New York City Department of Health stated that in 888 of 1,075 cases of trichinosis reported in New York City from 1934 to 1944, the histories indicated that the patients had eaten products of this kind. For these products no processing is now required by the regulations of the United States Department of Agriculture. The Department, however, requires processing of all other types of pork products; these must be heated to a temperature not lower than 137° F., cured by salting and smoking, or frozen. In the slow freezing process now recommended by the Federal regulations, pork products less than 6 inches thick are held at 5° F. for 20 days. Products in pieces more than 6 and less than 27 inches thick must be held for 30 days. Shorter periods are permitted if lower temperatures are applied; that is, 10 days for small pieces and 20 days for those more than 6 inches thick at −10° F., and 6 to 12 days, respectively, for the two sizes at −20° F.

In New York City there are regulations requiring that unless a processor uses pork previously frozen, he must heat thoroughly before selling any pork product customarily eaten uncooked. In a report of 84 cases of trichinosis in the city in 1945, Shookhoff and his associates (*11*) recorded that the pork used in the meats that caused the outbreak had not been frozen as recommended; it was said that refrigerating companies licensed to do this work had found it more profitable to use their facilities for other purposes, and consequently the practice of freezing pork had been discontinued.

Modern quick-freezing methods have not been adapted for use in the processing of pork. Augustine (*1*) experimented in 1933 with raw pork loin roasts in which infected guinea-pig muscle had been inserted. Then the infected cuts were brought rapidly to low temperatures varying from 18.1° to −34.6° C. (Note: −17.8° C. is equivalent to 0° F.) It was found that the parasites were not injured until the temperature reached −27.6° C. Complete destruction was attained, however, when trichinous material was lowered to −18° C. and held at that point for 24 hours. Dr. Augustine presented these figures before the subcommittee.

A report of a similar investigation was published in 1934 by Blair and Lang (*2*). These investigators used rat muscle in order to determine whether a different species of test animal would produce different results. Resistances to freezing were greater than those observed by Augustine. Blair and Lang found that larvae encysted in rat muscle could be killed by rapidly lowering the temperature to −35° C., but not until the muscle had been held at the lower temperature for 2 hours. They were of the opinion that it would be impracticable to use this method commercially because of the slow rate at which large volumes of pork and pork products cool. After experiments with pork roasts, the investigators concluded that commercial quantities of pork rapidly frozen to −17.8° C. must be stored at the same temperature for more than 48 hours. When ground meat was frozen rapidly, encysted trichinal larvae were killed in a few minutes. They concluded that additional investigation on the efficacy of quick freezing of heavily infected pork was imperative. They also suggested that studies of the effect of the age of the larvae and of the relation between resistances to cold of different species of animals would add value to comparisons of methods.

The committee consulted the American Society of Refrigerating Engineers for information concerning developments in freezing technics and the costs involved. That society's Technical Committee A–3 on Meat Packing, in a report prepared especially for the Committee on Public Health Relations, expressed the opinion that the freezing of all pork to destroy trichinae is impracticable under present conditions and that if freezing were practicable it would materially increase the cost of pork to the consumer. Members of the engineers' committee are as follows: J. P. McShane, Swift & Co., Chicago, chairman; H. K. Gillman, Tobin Packing Co., Fort Dodge, Iowa; T. A. D. Jones, Kingan & Co., Indianapolis; F. P. Neff, Tupman and Thurlow, Chicago; Starr Parker, H. H. Meyer Packing Co., Cincinnati; R. W. Ranson, John Morrell & Co., Ottumwa, Iowa; H. M. Shulman, Hammond Standish & Co., Detroit; K. E. Wolcott, Wilson & Co., Chicago, and J. S. Bartley, Rath Packing Co., Waterloo, Iowa.

The engineers estimated that it would require the equivalent of all the present freezer capacity in the United States to process all the pork produced, if the slow freezing now recommended by the Department of Agriculture were employed. If quick freezing methods should be developed, less space would be required, but more insulation and more refrigerating compressor displacement capacity would be necessary and the operating costs would then be higher. Moreover, other new facilities would be required in packing plants. Among such facilities were mentioned: Refrigerated space for wrapping and packaging the pork before freezing; storage space for boxes, cartons and other supplies, and new "thaw rooms" with controlled temperature, humidity and circulation of air for defrosting the pork to be cured. The engineers claim that to provide additional space it would be necessary to make extensive changes in plants or to utilize new public cold storage space.

Increased costs, which would be borne by the consumer, would arise partly from the acquisition of the new equipment and the extra space needed for large-scale refrigeration, and partly from the extra handling entailed in the freezing process. No actual estimates of the cost were submitted.

Certain other objections to freezing were advanced by the engineers: (1) The investment in the product and in special supplies would add to the risk of doing business; (2) the "dripping" and color of frozen pork make it unattractive; (3) the necessity for keeping the product frozen until it was ready for cooking would further complicate the handling and would necessitate special equipment in retail stores; and (4) it would be impossible to supervise the freezing of pork from hogs slaughtered on farms. The opinion was also expressed that regulations requiring the freezing of all pork might engender false feelings of security, since a small proportion from establishments which were not under effective inspection might still harbor trichinae. Some of the difficulties cited are probably exaggerated. Many retailers now have installed freezers in their stores for other frozen products; the danger from lack of supervision of individual farms would not be increased by a requirement for freezing. The matter of chief importance is the question of increased cost for a food which is as wholesome and popular as pork is.

A proposal to refrigerate all pork was advanced several years ago, but packers at that time declined to consider the idea on the ground that their facilities were inadequate. In the opinion of one observer, cooperation on the part of the packers with Federal, State, or local authorities on the control of trichinosis has never been forthcoming; it was his impression that the main attention of the trade had been directed to lessening publicity concerning the disease, because it was feared that publication of facts relating to it would react adversely on the industry.

In the recent statement on refrigeration, Gould (*5*) commented that "the main costs connected with this method of control of trichinosis are the costs of apparatus, such as refrigerating units and storage space. These expenses are initial ones and similar initial expenses would be found necessary in any other method. The operation or maintenance of the method, however, would require relatively little personnel as compared with microscopic inspection, and the method of processing would, therefore, be much cheaper. In the last analysis the cost of this method would be borne by the consumer. The consumer would in fact be glad to assume this extra cost if he could have the assurance that he was receiving meat that was free from living trichinae."

In the opinion of Ober (*9*), the growing popularity of deep-freeze cabinets in individual homes may be an important factor in encouraging the adoption of refrigeration as a method of destroying trichinae in pork. If the method was adopted generally, a decrease in trichinosis could be anticipated.

CONCLUSIONS

Trichinosis is a serious problem in public health, not only because of an appreciable mortality among the clinically recognized cases, but also because of the widespread invasion by the parasite that apparently escapes recognition and causes undetermined damage to the body over long periods of time.

The committee recognizes that the present regulations of the United States Department of Agriculture concerning processing of pork and pork products apply compulsorily only to those products which are usually eaten without cooking by the consumer, whereas many trichinous infections have been traced to pork products ordinarily cooked at home, such as roast pork or bacon. In using these products, the consumer's only protection against infection with trichinae lies in the thorough cooking of the meat.

The committee has been under the impression that the method of rapid chilling at low temperatures might provide an effective and inexpensive method of killing trichinae. The impression is not supported by the refrigerating engineers to whom the question was submitted.

The committee is of the opinion that a specific recommendation for change in the present requirements of the United States Department of Agriculture with regard to the processing of pork products to be eaten without further cooking is not now warranted. It is apparent that the laboratory observations on the use of low temperatures for short periods to destroy trichinae have not been accepted as justifying a change of method, and there is probably a difference of opinion as to the validity of these observations when low temperatures and brief exposures are applied on a commercial scale to bulk pork products.

There is at present no evidence to justify a broad recommendation that all pork products be frozen immediately after slaughtering and held at a low temperature for a sufficient period to destroy the trichinae. A complication into which the committee has not adequately inquired is that the freezing process may so alter the quality of the fresh pork as to offend the tastes of the purchasing public. Partial dehydration may overcome this objection.

If the statement of the refrigerating engineers is to be accepted without challenge, the adoption of freezing as a processing method for all pork products must be deferred until such time as storage space can be enlarged and the costs of handling can be set at reasonable levels.

From the information available to the committee, it appears that the boiling of garbage fed to hogs is not wholly impractical. The United States Public Health Service has advocated this practice for many years, and the committee favors a trial on a limited scale, possibly under the joint sponsorship of the Public Health Service, and a local department of health.

The committee is of the opinion that the matter is of sufficient importance for The New York Academy of Medicine to take the initiative in stimulating studies to determine whether more effective measures for the destruction of trichinae in pork products can be devised without an undue increase in cost.

RECOMMENDATIONS

The committee recommends that it be authorized to take steps to stimulate fundamental research on the potentialities of quick freezing as a method of processing pork. It proposes that representatives of the United States Public Health Service and the United States Department of Agriculture be invited to confer with representatives of The New York Academy of Medicine to explore the feasibility of research in this long-neglected field.

Without waiting for the completion of the suggested pathological and engineering studies, the committee recommends for consideration by the Commissioner and the Board of Health of New York City certain changes in regulations or methods of enforcement to reduce the danger of recurring outbreaks of trichinosis. Specifically it is recommended that (1) the New York City Department of Health, possibly with the cooperation of the United States Public Health Service, be urged to devise means (*a*) of excluding from New York City all pork from hogs fed on uncooked garbage, and (*b*) of prohibiting the shipment from New York City of garbage intended for the feeding of hogs unless the refuse has been heated to a temperature high enough to destroy trichinae; (2) the Department of Health adopt a regulation prohibiting the feeding of raw garbage to hogs while they are being held within the city for slaughter; (3) the Department of Health be urged to enforce strictly the provisions of the Sanitary Code relating to the proper cleansing of utensils and machines used in the preparation of pork products; (4) particular vigilance should be exercised in the supervision of the processing of products to be eaten without cooking by the consumer, and (5) the Department of Health should carry on an educational campaign concerning the dangers of eating insufficiently cooked pork, particularly when an outbreak offers occasion for special emphasis.

REFERENCES

(*1*) Augustine, D. L.: Effects of low temperatures upon encysted Trichinella spiralis. Am. J. Hyg. **17:** 697 (1933).

(*2*) Blair, J. B., and Lang, O. W.: Effect of low temperature freezing on the encysted larvae of Trichinella spiralis: Studies on muscle of rats, guinea-pigs and hogs. J. Infect. Dis. **55:** 95 (1934).

(*3*) Dickey, E. S.: Trichinosis as viewed by different interests. J. Am. Vet. M. A. **102:** 359 (1943).

(*4*) Gould, S. E.: Trichinosis: A major health problem in the United States. What should be done about it? Bull. N. Y. Acad. Med. **21:** 616 (1945).

(*5*) Gould, S. E.: Control of trichinosis. J. A. M. A. **129:** 1251 (1945).

(*6*) Gould, S. E.: Trichinosis, Springfield, Ill., Charles C. Thomas, 1945.

(*7*) Hall, M. C.: Studies on trichinosis: Past and present status of trichinosis in the United States and indicated control measures. Pub. Health Rep. **53:** 1472 (1938).

(*8*) Meat for millions. Report of N. Y. State Trichinosis Commission. Legislative Document No. 52, 1941.

(*9*) Ober, R. E.: Trichinosis: A review of cases in Massachusetts. New England J. Med. **235:** 839 (1942).

(*10*) Raw garbage and trichinosis. Editorial, Am. J. Pub. Health **30:** 1227 (1940).

(*11*) Shookhoff, H. B., Birnkrant, W. B., and Greenberg, M.: An outbreak of trichinosis in New York City, with special reference to intradermal and precipitin tests. Am. J. Pub. Health **36:** 1403 (1946).

(*12*) Wright, W. H.: Studies on trichinosis: A survey of municipal garbage disposal methods as related to trichinosis. Pub. Health Rep. **55:** 1075 (1940).

(*13*) Wright, W. H., and Bozicevich, J.: Experiments in the cooking of garbage for the destruction of trichinae in pork scraps. Pub. Health Rep. **58:** 396 (1943).

(*14*) Wright, W. H., Jacobs, L., and Walton, A. C.: Studies on trichinosis. Epidemiological considerations based on the examination for trichinae of 5,313 diaphragms from 189 hospitals in 37 States and the District of Columbia. Pub. Health Rep. **59:** 669 (1944).

(*15*) Wright, W. H., Kerr, K. B., and Jacobs, L.: Summary of the findings of Trichinella spiralis in a random sampling and other samplings of the population of the United States. Pub. Health Rep. **58:** 1293 (1943).

HEALTH OF ARC WELDERS IN STEEL SHIP CONSTRUCTION[1]

A Review

This report presents the clinical and environmental findings of a cooperative investigation into the respiratory health hazards of shipyard arc welders who were working with coated electrodes on bare steel or galvanized steel. The investigation was instituted by the Division of Shipyard Labor Relations, United States Maritime Commission, and was conducted cooperatively from April through December 1944 by the United States Public Health Service, United States Maritime Commission, and United States Navy Department.

---

[1] Health of arc welders in steel ship construction. By Waldemar C. Dreessen, Hugh P. Brinton, Robert G. Keenan, Thalbert R. Thomas, Edwin H. Place, and James E. Fuller. Pub. Health Bull. 298. Government Printing Office, 1947. For sale by the Superintendent of Documents, Washington 25, D. C. Price 55 cents.

Physical examinations were made on 4,650 individuals including 2,950 males and 1,700 females employed in 7 United States Maritime Commission or Navy-contract shipyards located on the Atlantic, Pacific, and Gulf Coasts. About one out of every four persons examined was a nonwelder and the medical findings of this group served to control the clinical observations on welders.

Quantitative measurements were made of the fume and gases contaminating the air of the work places. These data include 1,767 samples for iron and total fume, 278 samples for zinc, 25 samples for lead, and 2,019 samples for the oxides of nitrogen. Ventilation of some type was available in all the shipyards; although it was of various adequacy, extreme degrees of atmospheric contamination were infrequently observed.

Clinical observations were made on the general fitness of the shipyard workers examined. Some of the conditions noted, which were possibly related to welding exposure, include a respiratory symptom-complex (pharyngitis, rhinitis, and conjunctivitis), arc-welder's siderosis, cardiovascular hypotonia, and rather characteristic occupational stigmata of certain arc welders caused by burns of hot slag or molten metal. These conditions were either infrequent or of a low order of severity. Detailed blood studies failed to reveal any marked blood dyscrasias among welders. Gastrointestinal symptoms likewise were infrequent. There was no indication that welding fume, under the conditions observed, predisposed to pulmonary tuberculosis.

In general, the concentrations of welding fume and gas observed in the environmental phase of the study were relatively low, and the clinical findings were minimal. Great variation in the nature of the welder's work precludes reasonable estimates of weighted fume exposures. Safety and ventilating practices in the shipyards investigated seem to have aided materially in keeping diseases of industrial origin at low levels of significance.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED MARCH 20, 1948

Summary

A net decline in the incidence of influenza was reported for the current week (from 7,447 cases last week to 5,941 currently, as compared with an increase for the corresponding week last year from 21,991 to 42,997). The corresponding 5-year (1943–47) median is 4,054. Of the 11 States reporting more than 81 cases, 7 reported a combined decline of 1,745 cases, while 4 (Virginia, West Virginia, Oklahoma, and Colorado) showed an increase from 811 cases to 1,161 (the largest increase in Virginia, 459 to 687). The total for the year to date is 113,008, as compared with 105,579 for the corresponding period last year, which latter figure was also the 5-year median for the period.

Of 30 cases of poliomyelitis reported for the week, as compared with 25 last week, 33 for the corresponding week last year, and a 5-year median of 24, Iowa reported 8 (last 7 weeks 0), Texas and California 5 each (last week 3 and 4 cases respectively). No other State reported more than 2 cases. The current week corresponds with the approximate average date of lowest seasonal incidence of past years. The total to date is 347, as compared with 612 for the corresponding period last year, the highest of the past 5 corresponding periods, 263, the lowest (in 1944), and a 5-year median of 397.

One case of anthrax was reported for the week, in New Jersey, and 1 case of smallpox, in North Carolina. Since the first of the year, totals above the corresponding medians have been reported for amebic and unspecified dysentery, infectious encephalitis, influenza, measles, Rocky Mountain spotted fever, and undulant fever.

Deaths, all causes, recorded during the week in 93 large cities of the United States totaled 10,005, as compared with 9,789 last week, 10,186 and 9,569, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 9,640. The total for the year to date (12 weeks), is 123,298, as compared with 120,645 for the same period last year. Infant deaths totaled 624, as compared with 639 last week and a 3-year median of 650. The cumulative figure is 8,350, as compared with 9,731 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended March 20, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47
	Mar. 20, 1948	Mar. 15, 1947		Mar. 20, 1948	Mar. 15, 1947		Mar. 20, 1948	Mar. 15, 1947		Mar. 20, 1948	Mar. 15, 1947	
NEW ENGLAND												
Maine	1	0	2	-------	-------	-------	5	186	61	0	1	1
New Hampshire	1	0	0	-------	5	-------	13	32	11	0	3	0
Vermont	0	0	0	-------	-------	1	5	283	173	0	0	0
Massachusetts	5	26	7	-------	-------	-------	784	417	613	4	0	3
Rhode Island	0	1	0	-------	-------	-------	1	196	14	0	0	2
Connecticut	0	0	0	11	-------	3	66	566	407	0	0	3
MIDDLE ATLANTIC												
New York	5	10	10	[1] 25	[1] 9	[1] 6	2,034	319	2,321	4	8	36
New Jersey	5	7	3	54	6	7	1,145	558	1,366	1	0	7
Pennsylvania	5	13	10	(2)	[2] 3	[2] 3	1,070	367	1,258	5	6	16
EAST NORTH CENTRAL												
Ohio	10	7	7	6	91	20	1,599	731	731	4	2	8
Indiana	6	13	7	1	275	9	1,048	39	266	1	0	3
Illinois	1	6	6	6	55	22	2,599	44	963	4	5	18
Michigan [3]	2	8	8	-------	26	7	1,841	74	555	3	4	7
Wisconsin	2	3	1	38	154	46	1,138	247	1,046	0	0	4
WEST NORTH CENTRAL												
Minnesota	4	6	5	1	-------	1	283	65	65	0	7	4
Iowa	3	0	3	-------	970	-------	744	65	213	2	0	0
Missouri	8	13	7	4	208	4	436	15	375	3	4	7
North Dakota	0	5	2	-------	95	4	26	6	20	0	0	1
South Dakota	0	1	0	-------	18	-------	1	15	29	0	0	0
Nebraska	0	2	2	12	178	24	131	5	70	1	1	0
Kansas	2	8	5	54	6,260	5	61	9	513	0	0	1
SOUTH ATLANTIC												
Delaware	0	1	1	-------	-------	-------	43	1	17	0	0	0
Maryland [3]	4	7	7	5	3	4	81	19	73	1	2	9
District of Columbia	0	0	0	-------	4	1	148	24	100	0	0	1
Virginia	5	3	3	687	1,151	551	466	332	463	1	2	12
West Virginia	11	1	3	103	2,099	40	320	80	66	4	1	3
North Carolina	13	8	8	-------	-------	-------	5	400	389	0	3	6
South Carolina	6	2	4	745	1,518	449	108	79	190	1	1	1
Georgia	2	1	4	41	482	24	54	264	187	0	1	4
Florida	2	9	4	2	73	3	172	15	62	3	3	7
EAST SOUTH CENTRAL												
Kentucky	2	4	4	6	29	29	343	10	86	3	1	4
Tennessee	3	4	5	81	341	81	255	127	301	4	4	8
Alabama	6	8	6	272	328	168	82	88	216	1	5	5
Mississippi [3]	1	6	6	21	-------	-------	62	18	-------	1	1	5
WEST SOUTH CENTRAL												
Arkansas	4	3	5	254	5,306	109	238	383	196	0	3	3
Louisiana	2	13	6	13	6	13	34	56	68	2	6	6
Oklahoma	8	3	3	267	1,083	190	24	7	65	2	1	2
Texas	9	25	34	2,579	19,527	1,543	1,579	309	1,160	5	9	13
MOUNTAIN												
Montana	3	2	2	25	193	26	62	147	105	0	1	0
Idaho	9	0	0	33	144	20	68	6	69	0	0	0
Wyoming	2	1	1	-------	20	6	141	21	42	0	0	0
Colorado	3	5	5	104	1,604	39	555	46	350	1	2	0
New Mexico	2	1	1	7	3	1	7	45	20	0	0	1
Arizona	0	6	5	151	394	125	78	47	47	0	0	0
Utah [3]	0	0	0	56	67	8	36	22	104	0	0	1
Nevada	0	0	0	25	-------	-------	4	1	5	0	0	0
PACIFIC												
Washington	0	4	4	9	111	-------	310	55	210	1	3	6
Oregon	1	1	1	135	125	25	26	33	102	0	1	1
California	12	15	23	108	33	51	1,935	217	1,187	9	8	27
Total	170	262	262	5,941	42,997	4,054	22,266	7,091	23,150	71	99	243
11 weeks	2,385	3,233	3,233	113,008	105,579	105,579	153,809	56,072	152,241	938	933	2,791
Seasonal low week [4]	(27th) July 5-11			(30th) July 26-Aug. 1			(35th) Aug. 30-Sept. 5			(37th) Sept. 13-19		
Total since low	8,743	10,799	11,851	156,566	138,554	138,554	188,755	78,959	178,365	1,720	1,905	5,243

[1] New York City only.
[2] Philadelphia only.
[3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended March 20, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended— Mar. 20, 1948	Week ended— Ma.. 15, 1947	Median 1943-47	Week ended— Mar. 20, 1948	Week ended— Mar. 15, 1947	Median 1943-47	Week ended— Mar. 20, 1948	Week ended— Mar. 21, 1947	Median 1943-47	Week ended— Mar. 20, 1948 [5]	Week ended— Mar. 15, 1947	Median 1943-47
NEW ENGLAND												
Maine	0	0	0	11	24	24	0	0	0	0	0	0
New Hampshire	0	0	0	3	17	11	0	0	0	0	0	0
Vermont	0	1	1	0	0	8	0	0	0	0	0	0
Massachusetts	0	2	0	166	134	403	0	0	0	0	5	2
Rhode Island	0	0	0	7	12	14	0	0	0	0	0	0
Connecticut	0	1	0	52	38	69	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	1	1	1	291	387	655	0	0	0	1	2	3
New Jersey	0	0	0	118	166	182	0	0	0	0	0	0
Pennsylvania	0	1	1	330	228	447	0	0	0	3	4	4
EAST NORTH CENTRAL												
Ohio	2	0	0	500	430	430	0	2	0	4	0	2
Indiana	1	0	0	71	158	158	0	1	1	0	3	1
Illinois	0	1	1	161	171	224	0	1	1	1	0	2
Michigan [3]	1	0	0	159	214	214	0	0	0	0	2	2
Wisconsin	0	1	1	65	110	245	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	1	2	0	39	49	64	0	0	0	0	1	0
Iowa	8	0	0	46	35	64	0	0	0	4	0	0
Missouri	0	0	1	50	23	134	0	0	0	5	1	1
North Dakota	0	1	0	5	23	23	0	0	0	0	0	0
South Dakota	0	0	0	1	7	16	0	0	0	0	0	0
Nebraska	0	0	0	24	31	49	0	0	0	0	0	0
Kansas	0	0	0	30	48	106	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	11	21	16	0	0	0	0	0	0
Maryland [3]	1	1	0	43	38	112	0	0	0	0	1	1
District of Columbia	0	0	0	13	16	30	0	0	0	0	0	0
Virginia	0	0	0	18	49	93	0	0	0	6	0	1
West Virginia	1	0	0	33	26	38	0	0	0	0	4	2
North Carolina	1	0	0	19	29	41	1	0	0	0	0	0
South Carolina	0	0	0	3	17	8	0	0	0	0	1	1
Georgia	0	0	0	12	27	17	0	0	0	1	0	2
Florida	0	1	1	12	17	11	0	0	0	2	2	2
EAST SOUTH CENTRAL												
Kentucky	0	0	0	36	34	49	0	0	0	0	2	2
Tennessee	0	0	0	29	58	58	0	0	0	3	2	0
Alabama	1	1	0	13	20	20	0	0	0	0	1	1
Mississippi [3]	0	0	1	4	14	7	0	0	0	0	2	2
WEST SOUTH CENTRAL												
Arkansas	0	0	0	2	1	12	0	0	0	0	1	2
Louisiana	0	6	0	1	12	15	0	0	0	1	4	1
Oklahoma	0	0	0	17	21	21	0	0	0	1	0	0
Texas	5	1	1	48	53	71	0	0	0	5	2	6
MOUNTAIN												
Montana	2	0	0	9	4	11	0	0	0	0	0	0
Idaho	0	1	0	6	9	12	0	0	0	0	2	0
Wyoming	0	0	0	1	13	13	0	0	0	1	0	0
Colorado	0	0	0	35	64	71	0	1	1	0	0	0
New Mexico	0	1	0	7	8	14	0	0	0	0	0	0
Arizona	0	1	0	2	8	16	0	0	0	0	2	1
Utah [3]	0	0	0	16	17	41	0	0	0	0	0	0
Nevada	0	0	0	0	8	1	0	0	0	0	0	0
PACIFIC												
Washington	0	0	0	78	33	46	0	0	0	0	1	1
Oregon	0	0	0	27	40	40	0	0	0	0	0	0
California	5	9	4	112	167	205	0	0	0	3	3	3
Total	30	33	24	2,736	3,129	4,360	1	5	13	41	48	56
11 weeks	347	612	397	26,038	29,874	42,595	32	45	114	473	485	585
Seasonal low week [4]	(11th) Mar. 15-21			(32d) Aug. 9-15			(35th) Aug. 30-Sept. 5			(11th) Mar. 15-21		
Total since low	10,558	25,409	13,803	48,577	56,560	80,916	53	99	197	3,882	4,013	5,200

---

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately, as follows: Ohio 1, Virginia 1, Georgia 1, Tennessee 1, 'exas 1, California 1.

Telegraphic morbidity reports from State health officers for the week ended March 20, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended March 20, 1948							
	Week ended—		Median 1943-47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Mar. 20, 1948	Mar. 15, 1947		Amoebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	6	22	36								1
New Hampshire	8	5	1								
Vermont	43	6	18								1
Massachusetts	51	198	169		4		1				2
Rhode Island	4	10	30								
Connecticut	16	48	66								1
MIDDLE ATLANTIC											
New York	157	165	165	14	2		3				2
New Jersey	49	132	132								
Pennsylvania	91	242	205	1							3
EAST NORTH CENTRAL											
Ohio	138	147	147	3					1		13
Indiana	24	29	22				1				5
Illinois	36	73	73	3	1		5				9
Michigan [3]	131	281	120	9							10
Wisconsin	79	152	63	1							3
WEST NORTH CENTRAL											
Minnesota	19	8	20	2		1					4
Iowa	26	21	18								17
Missouri	34	9	10								1
North Dakota	5		1								
South Dakota	7	5	1								
Nebraska	2	2	10								
Kansas	75	21	28								3
SOUTH ATLANTIC											
Delaware	1	2	1								
Maryland [3]	13	90	59			1					5
District of Columbia	6	6	3								
Virginia	61	129	55			32					1
West Virginia	24	31	41								
North Carolina	45	64	115		1				1		
South Carolina	91	37	43		5					3	
Georgia	29	10	12		2				1	1	1
Florida	40	28	27	4						1	
EAST SOUTH CENTRAL											
Kentucky	16	30	37		1						
Tennessee	46	24	21	6			2		2		2
Alabama	22	34	34	2						1	1
Mississippi [3]	2	16		2					2		1
WEST SOUTH CENTRAL											
Arkansas	106	19	19	6					1		1
Louisiana	6	2	2	2							1
Oklahoma	28	16	16	2							1
Texas	362	481	230	12	199	43				3	6
MOUNTAIN											
Montana	10	4	4								
Idaho	6	2	3								
Wyoming	10		1								
Colorado	83	8	24								5
New Mexico	22	12	9								
Arizona	65	12	23			16					
Utah [3]	13	17	17								3
Nevada	3										
PACIFIC											
Washington	38	51	32	3		1					
Oregon	17	7	14	1							
California	103	183	183	9	1		1				2
Total	2,269	2,891	2,709	82	216	94	13	0	8	9	105
Same week: 1947	2,891			55	279	317	7	1	21	48	105
Median, 1943-47	2,709			27	275	90	9	0	14	34	[6] 86
11 weeks: 1948	24,659			676	2,777	2,348	104	6	208	159	992
1947	27,919			504	3,740	2,536	74	10	438	608	1,112
Median, 1943-47	26,139			297	3,195	1,212	94	4	218	533	[6] 923

[3] Period ended earlier than Saturday.

[6] 3-year median 1945-47.

Anthrax: New Jersey 1.

Alaska: Common respiratory diseases 54, erysipelas 1, influenza 8, mumps 2, pneumonia 7, measles 10, scarlet fever 5, whooping cough 6, septic sore throat 3, rheumatic fever 3.

Territory of Hawaii: Rabies 0, bacillary dysentery 6, leprosy 2, measles 3, paratyphoid fever 1, whooping cough 18.

WEEKLY REPORTS FROM CITIES *

City reports for week ended March 13, 1948

This table lists the reports from 90 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	------	0	1	0	5	0	0	7
New Hampshire:												
Concord	0	0	------	0	------	0	0	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	2
Massachusetts:												
Boston	8	0	------	1	385	1	14	0	55	0	0	5
Fall River	0	0	------	0	6	0	2	0	1	0	1	3
Springfield	0	0	------	0	------	0	0	0	0	0	0	3
Worcester	0	0	------	0	4	0	5	0	11	0	0	6
Rhode Island:												
Providence	0	0	1	0	------	0	6	0	5	0	0	10
Connecticut:												
Bridgeport	0	0	------	0	------	0	0	0	7	0	0	------
Hartford	0	0	------	0	3	0	2	1	3	0	0	------
New Haven	0	0	1	0	------	3	0	0	5	0	0	4
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	----	0	4	1	4	0	8	0	0	5
New York	7	0	29	0	1,414	3	78	1	107	0	1	27
Rochester	0	0	------	0	1	0	3	1	7	0	0	3
Syracuse	0	0	------	0	20	0	1	0	7	0	0	5
New Jersey:												
Camden	0	0	1	1	3	0	4	0	3	0	0	------
Newark	0	0	1	0	93	0	3	0	16	0	0	2
Trenton	0	0	------	0	1	0	7	0	8	0	0	------
Pennsylvania:												
Philadelphia	3	0	------	0	346	3	18	0	79	0	0	27
Pittsburgh	1	0	------	0	------	2	15	1	32	0	0	15
Reading	0	0	------	0	7	0	6	0	13	0	0	2
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	2	0	------	0	45	2	5	0	9	0	0	6
Cleveland	0	0	1	0	9	1	5	0	33	0	0	23
Columbus	1	0	1	1	122	0	1	0	10	0	0	6
Indiana:												
Fort Wayne	0	0	------	1	14	0	6	0	6	0	0	------
Indianapolis	0	1	------	0	187	1	7	0	10	0	0	3
South Bend	0	0	------	0	2	0	0	0	0	0	0	------
Terre Haute	1	0	------	0	5	0	1	0	0	0	0	3
Illinois:												
Chicago	1	0	------	0	969	2	22	0	62	0	0	23
Springfield	0	0	------	0	141	0	1	0	0	0	0	2
Michigan:												
Detroit	3	0	------	0	314	0	9	0	92	0	0	29
Flint	0	0	------	0	1	1	2	0	3	0	0	3
Grand Rapids	0	0	------	0	368	0	1	0	2	0	0	3
Wisconsin:												
Kenosha	0	0	------	0	141	0	0	0	0	0	0	------
Milwaukee	0	1	------	0	28	0	6	0	14	0	0	4
Racine	0	0	------	0	203	0	0	0	2	0	0	------
Superior	0	0	------	0	22	0	0	0	1	0	0	2
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	86	0	2	0	8	0	0	6
Minneapolis	0	0	------	0	54	0	4	0	14	0	0	4
St. Paul	0	0	------	0	54	0	7	0	4	0	0	7
Missouri:												
Kansas City	0	0	3	1	24	0	6	0	5	0	0	9
St. Joseph	0	0	------	0	------	0	0	0	2	0	0	------
St. Louis	8	0	2	1	175	2	10	0	17	0	1	4

* In some instances the figures include nonresident cases.

City reports for week ended March 13, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	-----	0	5	0	2	0	4	0	0	-----
Nebraska:												
Omaha	0	0	-----	0	63	0	1	0	5	0	0	-----
Kansas:												
Topeka	0	0	-----	0	12	0	1	0	0	0	0	-----
Wichita	0	0	-----	0	1	0	2	0	1	0	0	3
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	-----	0	19	0	3	0	2	0	0	-----
Maryland:												
Baltimore	3	0	6	2	26	2	8	0	13	0	0	12
Cumberland	1	0	-----	0	-----	0	0	0	3	0	0	-----
Frederick	0	0	-----	0	-----	0	0	0	0	0	0	-----
District of Columbia:												
Washington	0	0	-----	0	175	0	11	0	9	0	0	4
Virginia:												
Richmond	1	0	1	0	-----	1	0	0	3	0	0	5
Roanoke	0	0	-----	0	-----	0	0	0	1	0	0	-----
West Virginia:												
Charleston	0	0	-----	0	16	0	3	0	0	0	0	-----
Wheeling	0	0	-----	0	8	0	2	0	2	0	0	-----
North Carolina:												
Raleigh	0	0	-----	0	-----	0	2	0	0	0	0	-----
Wilmington	0	0	-----	0	-----	0	2	0	0	0	0	-----
Winston-Salem	0	0	-----	0	-----	0	0	0	0	0	0	-----
South Carolina:												
Charleston	1	0	60	0	1	0	3	0	0	0	0	-----
Georgia:												
Atlanta	0	0	2	0	1	0	4	0	6	0	0	-----
Brunswick	0	0	-----	0	1	0	0	0	0	0	0	-----
Savannah	0	0	-----	0	-----	0	0	0	0	0	0	1
Florida:												
Tampa	0	0	3	0	44	0	2	0	0	0	0	10
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	-----	0	142	0	9	0	2	0	0	3
Nashville	1	0	-----	1	-----	0	1	0	3	0	0	2
Alabama:												
Birmingham	0	0	7	0	2	0	9	0	0	0	1	-----
Mobile	0	0	52	1	-----	3	4	2	2	0	0	-----
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	-----	1	2	0	1	0	1	0	0	2
Louisiana:												
New Orleans	0	0	10	1	1	2	11	0	0	0	0	2
Shreveport	0	0	-----	0	-----	0	4	0	0	0	0	-----
Oklahoma:												
Oklahoma City	0	0	22	0	3	0	2	0	0	0	0	-----
Texas:												
Dallas	1	0	-----	0	66	0	2	0	2	0	0	1
Galveston	2	0	-----	0	1	0	5	0	0	0	0	-----
Houston	1	0	5	2	32	1	6	0	1	0	0	1
San Antonio	0	0	-----	0	3	0	6	0	1	0	0	-----
MOUNTAIN												
Montana:												
Billings	0	0	-----	0	-----	0	2	0	0	0	0	1
Great Falls	0	0	-----	0	2	0	1	0	0	0	0	1
Helena	0	0	-----	0	-----	0	0	0	0	0	0	-----
Missoula	0	0	-----	0	7	0	0	0	2	0	0	-----
Idaho:												
Boise	0	0	-----	0	-----	0	1	0	0	0	0	-----
Colorado:												
Denver	2	0	1	0	310	0	2	0	5	0	0	19
Pueblo	0	0	-----	0	75	0	1	0	2	0	0	-----
Utah:												
Salt Lake City	0	0	-----	0	14	0	1	1	0	0	0	-----

City reports for week ended March 13, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	2	14	0	6	0	14	0	0	2
Spokane	0	0	------	0	3	0	2	0	3	0	0	------
Tacoma	0	0	------	0	60	0	0	0	1	0	0	------
California:												
Los Angeles	3	0	11	1	129	2	11	1	10	0	0	23
Sacramento	0	0	1	0	-------	0	3	0	1	0	0	1
San Francisco	4	0	10	0	424	0	7	0	6	0	0	9
Total	55	2	231	17	6,913	33	407	8	771	0	4	365
Corresponding week, 1947[1]	62	-----	441	27	1,455	------	422	------	787	0	6	622
Average 1943-47[1]	69	------	220	[2] 30	[3] 5,701	------	[2] 438	------	1.547	1	10	633

[1] Exclusive of Oklahoma City. [2] 3-year average, 1945-47. [3] 5-year median, 1943-47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 90 cities in the preceding table (latest available estimated population, 34,591,500)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	20.9	0.0	5.2	2.6	1,040	10.5	78.4	2.6	240	0.0	2.6	105
Middle Atlantic	5.1	0.0	14.3	0.5	874	4.2	64.3	1.4	130	0.0	0.5	40
East North Central	4.9	1.2	1.2	1.2	1,563	4.3	40.1	0.0	148	0.0	0.0	65
West North Central	15.9	0.0	9.9	4.0	943	4.0	69.6	0.0	119	0.0	2.0	66
South Atlantic	9.9	0.0	119.2	3.3	482	5.0	66.2	0.0	65	0.0	0.0	53
East South Central	5.9	0.0	348.2	11.8	850	17.7	135.7	11.8	41	0.0	5.9	30
West South Central	10.2	0.0	94.0	10.2	274	7.6	94.0	0.0	13	0.0	0.0	15
Mountain	15.9	0.0	7.9	0.0	3,241	0.0	63.5	7.9	71	0.0	0.0	167
Pacific	11.1	0.0	34.8	4.7	966	3.2	45.9	1.6	55	0.0	0.0	55
Total	8.3	0.3	34.9	2.6	1,045	5.0	61.5	1.2	117	0.0	0.6	55

Dysentery, amebic.—Cases: Buffalo 1, New York 7, Cleveland 1, Washington 1, Memphis 1, New Orleans 1, Spokane 1, Los Angeles 1.

Dysentery, bacillary.—Cases: Worcester 1, Nashville 1.

Dysentery, unspecified.—Cases: Baltimore 2, San Antonio 1.

Tularemia.—Cases: Memphis 1, Little Rock 1.

Typhus fever, endemic.—Cases: Tampa 1.

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—January 1948.—During the month of January 1948, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Residence [1]									
	Panama City		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	8		1				3		12	
Diphtheria	8				1		8	1	17	1
Dysentery:										
Amebic			1				3		4	
Bacillary	2		1		5		1		9	
Hepatitis, infectious					4				4	
Malaria [2]	8			1	4		201	1	213	2
Measles	1		1		4		1		7	
Meningitis, meningococcus			1		1				2	
Mumps	1				2		1		4	
Pneumonia		13		1	22	1		6	(3)	21
Tetanus	1								1	
Tuberculosis		19		5	2			9	(3)	33
Typhoid fever								1		1
Whooping cough						1			(3)	1
Yaws							2		2	

[1] If place of infection is known, cases are so listed instead of by residence.
[2] 11 recurrent cases.
[3] Reported in the Canal Zone only.

DEATHS DURING WEEK ENDED MAR. 13, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Mar. 13, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	9,789	10,310
Median for 3 prior years	9,622	
Total deaths, first 11 weeks of year	113,293	110,459
Deaths under 1 year of age	639	777
Median for 3 prior years	663	
Deaths under 1 year of age, first 11 weeks of year	7,726	9,010
Data from industrial insurance companies:		
Policies in force	66,819,835	67,329,528
Number of death claims	14,725	12,210
Death claims per 1,000 policies in force, annual rate	11.5	9.5
Death claims per 1,000 policies, first 11 weeks of year, annual rate	10.3	9.8

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended February 28, 1948.—During the week ended February 28, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		44	3	312	394	59	27	52	182	1,073
Diphtheria				27			3			30
Encephalitis, infectious				1						1
German measles				20	49		1	13	13	96
Influenza		94			6	7			60	167
Measles		2	5	1,470	1,329	12	12	25	138	2,993
Meningitis, meningococcus				4	1				1	6
Mumps		23	1	431	311	48	91	25	40	970
Poliomyelitis					2	1		1		4
Scarlet fever		5	3	49	72	1	3	5	7	145
Tuberculosis (all forms)			7	156	32	25	15	4	78	317
Typhoid and paratyphoid fever				9				1		10
Undulant fever				7						7
Venereal diseases:										
Gonorrhea	1	18	7	91	83	30	20	34	83	367
Syphilis		11	6	126	57	9	7	9	32	257
Whooping cough				48	28	10	2	45	27	160

CUBA

Habana—Communicable diseases—4 weeks ended February 28, 1948.—During the 4 weeks ended February 28, 1948, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chickenpox	4		Scarlet fever	1	
Diphtheria	25		Tuberculosis	5	2
Measles	12		Typhoid fever	6	

Provinces—Notifiable diseases—4 weeks ended February 28, 1948.—During the 4 weeks ended February 28, 1948, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana[1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	5	7	10	22	3	27	74
Chickenpox		5	35		7	6	53
Diphtheria	1	26		1	1	5	34
Leprosy		4		2			6
Malaria	4			3	4	17	28
Measles		17	4	14		14	49
Scarlet fever		2					2
Tuberculosis	6	18	10	21	2	45	102
Typhoid fever	5	13	1	6	3	18	46

[1] Includes the city of Habana.

FINLAND

Notifiable diseases—January 1948.—During the month of January 1948, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	13	Poliomyelitis	8
Diphtheria	527	Scarlet fever	342
Dysentery	4	Syphilis	330
Gonorrhea	1,046	Typhoid fever	40
Paratyphoid fever	226		

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Plague

China—Yunnan Province—Paoshan.—Plague has been reported in Paoshan, Yunnan Province, China, as follows: For the period January 1–10, 1948, 3 cases; for the period January 11–20, 1948, 11 cases with 4 deaths; for the period January 21–31, 1948, 6 cases with 2 deaths.

Peru.—For the month of January 1948, 1 case of plague was reported in the District of Santa Maria, Chancay Province, Huacho Department, Peru, and for the same period 4 cases with 2 deaths were reported in Leticia, Lima Province in Lima Department.

Rhodesia (Northern).—For the week ended March 6, 1948, 8 cases of plague, with 6 deaths, were reported in Northern Rhodesia.

Smallpox

Belgian Congo.—For the week ended February 14, 1948, 115 cases of smallpox (including 113 cases of alastrim) were reported in Belgian Congo.

Burma.—For the week ended March 6, 1948, smallpox was reported in Burma as follows: In Moulmein, 34 cases, in Rangoon, 31 cases.

China—Shanghai.—For the week ended March 6, 1948, 89 cases of smallpox were reported in Shanghai, China.

India—Calcutta.—For the week ended March 6, 1948, 358 cases of smallpox were reported in Calcutta, India.

Iraq.—For the week ended February 28, 1948, 43 cases of smallpox, with 3 deaths, were reported in Iraq, and for the week ended March 6, 1948, 52 cases, with 2 deaths, were reported, including 46 cases, 1 death in Baghdad.

Mexico.—For the month of January 1948, 138 cases of smallpox were reported in Mexico.

Venezuela.—During the period January 11 to March 6, 1948, 892 cases of smallpox (including alastrim), with 12 deaths, were reported in Venezuela, including 181 cases, 2 deaths, in Maracaibo, and 77 cases, 2 deaths, in Puerto La Cruz. For the week ended March 6, 1948, cases and deaths were reported in ports in Venezuela as follows: Maracaibo 22 cases, Puerto La Cruz 16 cases, 1 death, Bolivar 2 cases, Cumaná 2 cases, Puerto Cabello 2 cases, and Carúpano 1 case, 1 death.

Typhus Fever

Mexico.—For the month of January 1948, 188 cases of typhus fever were reported in Mexico.

Yellow Fever

Nigeria—Lagos Island.—On March 2, 1948, 1 suspected case of yellow fever was reported in Igbo Village, Lagos Island, Nigeria.

FEDERAL SECURITY AGENCY
OSCAR R. EWING, *ADMINISTRATOR*

UNITED STATES PUBLIC HEALTH SERVICE
LEONARD A. SCHEELE, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS
G. ST. J. PERROT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 14, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948

For sale by the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C

Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 APRIL 16, 1948 NUMBER 16

IN THIS ISSUE

Program of the National Cancer Institute

1798

FEDERAL SECURITY AGENCY

PUBLIC HEALTH SERVICE

Linlithgow Library.

FEDERAL SECURITY AGENCY
OSCAR R. EWING, *Administrator*
PUBLIC HEALTH SERVICE
LEONARD A. SCHEELE, *Surgeon General*
DIVISION OF PUBLIC HEALTH METHODS
G. ST. J. PERROTT, *Chief of Division*

CONTENTS

	Page
The program of the National Cancer Institute	501

INCIDENCE OF DISEASE

United States:	
Reports from States for week ended March 27, 1948, and comparison with former years	518
Weekly reports from cities:	
City reports for week ended March 20, 1948	522
Rates, by geographic divisions, for a group of selected cities	524
Foreign reports:	
Canada—Provinces—Communicable diseases—Week ended March 6, 1948	525
Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—	
Cholera	525
Plague	525
Smallpox	526
Typhus fever	526
Yellow fever	526
Deaths during week ended March 20, 1948	527
Announcement—Appointments for engineer officers in the Public Health Service	527

Public Health Reports

Vol. 63 • APRIL 16, 1948 • *No. 16*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

THE PROGRAM OF THE NATIONAL CANCER INSTITUTE[1]

Cancer is well recognized as a major public health problem in the United States today. It has steadily increased its toll to more than 180,000 lives a year, and as a cause of death, has become second only to heart diseases, and first for women between the ages of 35 and 54. In truth, the problem warrants our growing concern. But fortunately an enlightened public is now seeking earlier treatment; the medical profession is better prepared to combat cancer than ever before; and science, through research, continues to offer hope of an ideal preventive or cure.

For the last quarter of a century, the Federal Government has taken some part in cancer research, and more recently in cancer control activities. However, it was not until 1937, in response to repeated demands for increased guidance and active assistance in these fields, that the National Cancer Institute was established and placed in the National Institute of Health, the principal research branch of the United States Public Health Service. The program of the National Cancer Institute is designed for the effective performance of two functions: first, to minimize cancer deaths through prevention, early discovery and adequate treatment; and second, to increase our knowledge of the disease through laboratory and clinical research, with universal eradication of cancer as the ultimate goal.

The functions of the Federal Government in cancer research and control were broadly but definitively outlined in the National Cancer Institute Act of 1937, which created the Institute and the National Advisory Cancer Council. The latter is composed of six leading cancer experts who serve 3-year terms, with the Surgeon General as chairman. The Council advises on Institute plans and policies, and reviews and makes recommendations on grant-in-aid applications.

Present members of the Council are Dr. Charles Huggins, professor of surgery at the University of Chicago School of Medicine; Dr. Robert S. Stone, professor of radiology at the University of California School of Medicine; Dr. Shields Warren, assistant professor of pathology, Harvard Medical School; Dr. Waltman Walters of the Mayo Clinic and professor of surgery, University of Minnesota School of Medicine; Dr. Edward A. Doisy, professor of biochemistry at the St. Louis University School of Medicine and one of the Nobel Prize winners in medicine in 1943; and Dr. John J. Morton, Jr., professor of surgery at the University of Rochester (New York) School of Medicine and Dentistry. Dr. A. C. Ivy who is vice president in charge of professional colleges of the University of Illinois is executive director of the Council.

---

[1] From the Cancer Reports Section. Prepared by William Carrigan and Ora Marshino.

In July 1947 the National Cancer Institute was reorganized to provide for effective integration of a much-expanded program. For administrative purposes, the activities of the Institute were divided into three major fields—scientific research within the Institute, research grants to outside institutions, and cancer control. The Institute is directed by Dr. Leonard A. Scheele. Dr. Harry Eagle is scientific director of the Research Branch; Dr. David E. Price is chief and Dr. Ralph G. Meader is scientific director of the Research Grants Branch; Dr. Austin V. Deibert, assisted by Dr. Raymond F. Kaiser, directs the Cancer Control Branch.

The Institute's total appropriation for the fiscal year 1948 is $14,000,000. $2,885,000 has been allocated for intramural research; $4,803,000, for cancer research grants; and $5,777,000, for cancer control purposes. Of the total control allotment, $2,500,000 has been set aside for State health agencies, $1,000,000 for special control-project grants, $250,000 for clinical traineeships, $1,500,000 for grants to medical and dental schools for the improvement of undergraduate cancer teaching, and $527,000 for control demonstrations, consultation and control administration. The remainder of the $14,000,000 has been allocated for research fellowships ($300,000) and for administration of the over-all program ($235,000). Thus, approximately 40 percent of the total appropriation for the year 1947–48 will be expended for cancer control, and most of the remainder will be used for research.

CANCER RESEARCH

Cancer research within the Public Health Service was initiated in 1923 by two groups of scientists—one at Harvard University, under Dr. J. W. Schereschewsky, and the other at the Hygienic Laboratory in Washington, D. C., under Dr. Carl Voegtlin. When merged in 1937, these groups formed the nucleus of the National Cancer Institute. Dr. Voegtlin became the first chief of the Institute in January 1938. He was succeeded by Dr. R. R. Spencer upon his retirement in July 1943.

The research of the Institute has been conducted, for the most part, in a well-equipped building completed in 1939 at Bethesda, Md.

This is one of the buildings that compose the National Institute of Health, constructed about 10 miles from the center of Washington on a plot of land donated by Mr. and Mrs. Luke I. Wilson. In January 1948 another building on the grounds of the National Institute of Health became the second large laboratory of the National Cancer Institute.

The investigation of cancer in human beings is pursued in hospitals that serve the Institute as clinical research laboratories. First to be used was the Tumor Clinic of the United States Marine Hospital in Baltimore, Md., where merchant marine personnel and other Public Health Service beneficiaries may report for cancer diagnosis and treatment. Specialized clinical research is conducted at several other hospitals, including Laguna Honda Home, associated with the University of California Medical School, and the Warwick Clinic at Garfield Hospital in Washington, D. C. Part of a new appropriation to the National Institute of Health will enable the Cancer Institute to purchase land and draw plans for its share of a new clinical facility. This will be a 500-bed research hospital at Bethesda headquarters, of which 150 beds will be used for cancer research, 150 for heart disease research, 150 for mental health studies, and 50 for other diseases.

In order to facilitate publication and distribution of scientific reports, the Journal of the National Cancer Institute is issued bimonthly. This carries the findings of scientists working at the National Cancer Institute and accounts of outside research. Occasionally an entire issue is devoted to a special subject, such as a gastric cancer conference sponsored by the National Advisory Cancer Council. One thousand copies of the Journal are sent free to research scientists and scientific libraries, and others are distributed to subscribers.[2]

It is generally recognized that the cancer problem, because of its broad scope as a problem of growth, requires the inter-disciplinary efforts of a research group in which many basic sciences are represented. In the development of the Institute's research staff, therefore, attempts have been made to select workers on the basis of training in the fundamental medical and biological sciences rather than their particular experience in the field of cancer. There is also a flexible separation of activities into projects. At present the Research Branch comprises more than 250 scientists, technicians, and attendants.

The laboratory research staff, under the direction of Dr. Harry Eagle, is divided into administrative sections headed as follows: Biology, Dr. H. B. Andervont; Biochemistry, Dr. J. T. Greenstein; Chemotherapy, Dr. M. J. Shear; Biophysics, Dr. E. Lorenz; Endocrinology, Dr. R. Hertz; Pathology, Dr. H. L. Stewart; Biostatistics, Dr. Harold Dorn; and the California Laboratory of Experimental

---

[2] Subscriptions at $2.00 a year may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. Single copies, 40 cents each.

Oncology, Dr. M. B. Shimkin. The work of the sections may be described as follows:

Biology.—The literature of cancer indicates that the following definition would be generally accepted: A cancer is a malignant neoplasm (new growth) resulting from a transformation of normal cells to cells that multiply excessively, become parasitic, and in most types of cancer, invade surrounding tissue and metastasize (spread to other parts of the body). Since cancer occurs in many multicellular species and all mammals, it is often assumed to be a universal cell potentiality. Primarily, then, the malignant change involves the multiplication, differentiation and organization of cells and related processes, common to all multicellular life—in a word, biology. Hence, to advance the science of biology is to approach a solution of the cancer problem.

One invaluable technique employed by this section is the artificial production of cancer in experimental animals. Cancers may be induced by means of (1) injection or feeding of more than 300 different chemicals, some of which are organ specific, (2) genetic manipulations (inbreeding and crossbreeding), (3) hormonal disturbances, (4) energy agents (X-rays, ultraviolet rays, heat, radium, etc.), and (5) combinations of these. The artificial production of cancer yields data concerning influences in carcinogenesis and provides tumors for further study.

Another project is the study of tumors grown within a transparent chamber attached to the living animal. This technique, developed at the Institute, permits microscopic comparison of growing tissues, malignant and normal, and is used to observe effects of therapeutic agents.

In studies employing another technique—the growth of animal tissue in vitro—the usual procedure is to cause and observe cancerous changes in cells growing outside the body. The cancerous tissue, if transferred to an animal, continues to grow autonomously; whereas normal tissue, though its growth be unlimited in vitro, is again regulated after such a transfer.

Little is known of the cellular transformation preceding malignancy. Accordingly, investigations in developmental embryology and physiology are made of tissues, ova, and lower forms of animal life such as protozoa, in order to study the differences between normal processes of growth and differentiation and those involved in carcinogenesis.

In tumor immunity projects, the reactions of animals to the growth of transplated tumors are investigated. The findings are applied in efforts to control tumors that arise spontaneously.

Much has been accomplished in genetics, in which studies are undertaken to ascertain the place of heredity in the occurrence of spontaneous tumors in animals and man. The study of mammary and gastric cancer is emphasized. Intensive efforts are made to define relations between the factors of mammary tumor development in the mouse, which include an infectious agent believed to be a virus.

In the investigation of gastric cancer, data from clinical studies are analyzed to guide in attempts to reproduce the disease in animals by altering the physiology of the stomach. The study of spontaneous tumors in animals has contributed to the understanding of cancer in man.

The section is also engaged in establishing procedures for the isolation of tumor-inducing viruses. Attempts are made to characterize these agents and to explain their intricate relations to living cells.

Adaptation studies are also conducted. Strictly speaking, cancer cannot be called a universal cell potentiality, since it cannot, by definition, occur in unicellular organisms. But processes similar to some that occur in cancer may be observed when bacteria and protozoa are exposed to known carcinogens over many generations. Strains of paramecia, long exposed to methylcholanthrene and then removed, showed enhanced survival value and population levels. Again, certain species tended to adapt to unnatural conditions when exposure was rhythmic, but perished when continuous. The possible bearing of these adjustment processes on the genesis of mammalian cancer is being investigated.

Biochemistry.—Morphologic and physiologic differences between normal and cancerous tissues suggest chemical differences, which may indicate approaches to therapy. Many differences have already been observed. It has been shown that the enzyme pattern of cancers more closely resembles that of embryonic than of adult tissue, and that diets deficient in certain protein constituents retard carcinoma in mice.

Projects include comparative metabolism and enzyme studies; comparison of carbohydrates, proteins, fats and other tissue components common to the normal and malignant state; and nutrition and intermediary metabolism studies, in which comparisons are made of the dietary requirements of normal and tumor-bearing animals, and of the fate of dietary constituents in their passage through the body. One technique employed is the tracing of stable or radioactive isotopes that have been specifically placed in certain constituents of the diet.

Chemotherapy.—In general the work of this section is directed toward discovery and investigation of chemical agents that may result in a chemical treatment of cancer in man. At present most chemicals that are effectively tumor-necrotizing are unduly toxic. Some degree of success, however, has been reported for such agents as bacterial metabolites, certain organic arsenical compounds, colchicine derivatives and podophyllotoxin.

This section conducts intensive studies in organic chemistry, biochemistry, pharmacology, physiology, immunology and bacteriology. Several of the agents developed by the section have been given preliminary clinical trial. Since the investigation is directed toward the ultimate treatment of patients, more extensive collaboration with clinicians is projected as the experimental work advances.

Endocrinology.—The relation between cancer and hormones is well established by facts such as these: (1) Hormones influence normal growth, (2) reduction of male hormones (by castration) or addition of female hormones may inhibit cancer of the prostate, (3) reduction of male or addition of female hormones may promote cancer of the breast, (4) reduction of female or addition of male hormones may inhibit cancer of the breast, and (5) there is a similarity in chemical constitution between the steroid hormones and certain carcinogens. Accordingly, studies in endocrinology are undertaken to contribute knowledge of the role of hormones in normal and pathologic processes and to develop therapeutic methods. In laboratory and clinical investigation, emphasis is placed upon cancer of the breast, uterus and prostate, as well as on hormone-producing tumors of the pituitary, ovary, testis, and adrenal glands. New methods for the treatment of persons with cancer of the prostate or breast have been developed through investigations in this field.

Biophysics.—In projects of this section, physical agents and methods are applied to biologic problems of cancer. At present the section is mainly interested in the biologic effects of radiation on cells, cell constituents, unicellular organisms and laboratory animals. The ultimate aim is a better understanding of the mechanism of cell destruction and the subsequent proliferative changes that lead to carcinogenesis. Nonionizing (ultraviolet) and ionizing radiations (X-rays, gamma rays, etc.) are used in this work. Instruments are adapted or developed for specific purposes such as dose measurements of radiation from external sources, and of internally administered radioactive isotopes.

Another major problem concerns the physico-chemical properties of cell constituents, especially viruses. Techniques used include ultracentrifugation, electrophoresis, and electron microscopy.

Jointly with Biochemistry, the Biophysics Section investigates the metabolism of normal and cancerous tissues by means of stable, rare isotopes. Analysis with a mass spectrometer reveals the way in which biochemical compounds are metabolized.

Pathology.—This section applies many major branches of pathology in a broad attack upon the cancer problem. Progress has been made in organizing a staff trained in neuropathology, endocrine and orthopedic pathology, dermatological and oral pathology, gynecologic and urologic pathology, and respiratory, gastrointestinal, and ophthalmic pathology and hematology. These groups will be assisted by a unit on biochemistry, bacteriology, clinical pathology and serology, and pathology technology.

When reports of investigations in cancer are reviewed, information is found to be inadequate on the effects of the disease upon many body systems. This section, however, is engaged in experiments that should add much to the knowledge of liver function in rats with hepatomas, the normal blood picture in mice, early cancer of the gastrointestinal tract, histogenesis and classification of leukemia in mice, and the cytology of lung tumors. Studies of endocrine and brain-tissue tumors are planned.

Biostatistics.—This section is responsible for two types of projects: (1) Provision of assistance to scientists conducting laboratory experiments in the Institute, and (2) statistical studies of cancer mortality and morbidity. In projects of the first type, assistance is given in designing experiments, analyzing results, and developing new techniques for quantitative investigation. The mortality and morbidity studies include the development of a case-reporting system and surveys to determine the extent of control measures.

Laboratory of Experimental Oncology.—This section of the National Cancer Institute is detailed to the University of California Medical School, San Francisco, for cooperative investigation of neoplastic disease. The objective of the Laboratory is clinical research in cancer. With the cancer patient as the focal point of investigation, the work is oriented along three broad approaches: (1) Physiology, including cardiovascular and respiratory physiology of the cancer patient as compared with that of other patients, and the study of electric potentials and other physiological characteristics of human neoplastic tissue, in vitro and in vivo; (2) biochemistry-metabolism, including the over-all caloric and protein balance of the cancer patient, and studies of specific biochemical reactions; and (3) clinical chemotherapy, providing material for the first two approaches, utilizing their techniques, and permitting studies in clinical pharmacology of new agents in cancer treatment.

In addition, immunological techniques are utilized in studying fractions of cancer and normal cells of human origin.

CANCER RESEARCH GRANTS

The support of research in institutions outside the Federal Government's own laboratories was a new venture in the Public Health Service when the National Cancer Institute was established in 1937. The act creating the Institute gave the National Advisory Cancer Council the authority "to review applications from any university, hospital, laboratory, or other institution, whether public of private, or from individuals, for grants-in-aid for research projects relating to cancer, and certify to the Surgeon General its approval of grants-in-aid in the cases of such projects which show promise of making valuable contributions to human knowledge with respect to the cause, prevention, or methods of diagnosis or treatment of cancer." The Surgeon General was in turn authorized "to make grants-in-aid for research projects certified by the Council."

At its second meeting held in November 1937, the Council recommended the first grants to further the investigations of Dr. E. O. Lawrence at the University of California, Dr. L. F. Fieser at Harvard University and Dr. E. W. Wallace at the University of Cincinnati. The grants were paid, and this combined action of the Council and Surgeon General may be said to have inaugurated the Government's cancer research grants-in-aid program. The first three grants totalled $54,910. Six others bringing the total up to $90,925 were made during the first year. The following table shows the number of grants and amounts paid up to January 1, 1948.

Fiscal year—	Number of grants	Total paid	Fiscal year—	Number of grants	Total paid
1938	9	$90,925.00	1944	5	52,540.00
1939	10	68,002.50	1945	9	85,027.50
1940	13	61,380.00	1946	13	76,890.94
1941	12	77,870.00	1947	51	469,634.50
1942	12	78,146.00	1948 (first 6 months)	143	1,332,919.00
1943	9	49,400.00			

Cancer research, like all peacetime research, was retarded during the war years. The return to peace liberated many scientists from wartime pursuits, and growing public support of cancer research turned their energies to this work. The concurrent popular realization of cancer's place as a major cause of death, inspired largely by the educational program of the American Cancer Society, led to the larger allotments of the fiscal year 1947 and to the greatly increased appropriations of 1948. By 1947 the National Cancer Institute was spending nearly half a million dollars for research grants to nonfederal laboratories. In 1948 this was increased to $4,803,000. This sum exceeds the total expenditure for grants during the entire preceding 10 years of the Institute's existence.

In this current appropriation the Congress authorized the Surgeon General to make grants for the construction of research facilities, in addition to grants for the support of research projects. The allotments established provide $2,500,000 for project grants, and $2,303,000 for construction grants-in-aid.

The widespread interest in cancer research is indicated by the fact that grants have been awarded for the work of 192 different investigators in 88 institutions, mostly universities, or hospitals with research laboratories. They have been given to support a wide variety of investigations in every branch of biology, in chemistry, physics, clinical medicine, and in work directed at improving the diagnosis and treatment of cancer. In several instances projects requiring a number of years to complete have been supported continuously.

The recommendations of the National Advisory Cancer Council are made after careful review of the proposed project and a discussion of its merits. Each application is sent to all members of the Council sufficiently in advance of a meeting to permit such inquiries and investigation as may be indicated. The staff of the Cancer Institute, and consultants selected for their familiarity with specific areas of the cancer research field, assist the Council in assembling the information needed to frame its recommendations.

A Committee on Gastric Cancer was formed in 1940 to create greater research interest in gastric cancer and to stimulate investigators who had not previously had primary interest in gastric cancer to enter this field. Three conferences, attended by leading specialists in scientific disciplines bearing on the problem, helped to direct attention to the possibility of a broader attack on this type of cancer. The number of gastric cancer projects now under way (see table) reflects the success of this committee's work.

Present grants.—On January 1, 1948, the active grants numbered 160. They support work in 82 institutions in 26 States, the District of Columbia, and in two foreign countries. Space does not permit the listing of each project, but the following summary shows the fields of investigation being subsidized, the number of active grants and the amount of subsidy in each field.

Field of investigation	Number of active grants	Amount	Field of investigation	Number of active grants	Amount
Carcinogenesis	16	$200, 247	Isotopes	2	18, 208
Chemistry	2	20, 668	Viruses	9	78, 581
Extracts affecting growth	2	13, 000	Blood	1	17, 388
Proteins and enzymes	8	107, 598	Children's tumors	1	20, 000
Chemotherapy	29	448, 963	Gastro-intestinal	2	10, 320
Comparative pathology	2	14, 110	Colon	1	9, 375
Cytology and cytochemistry	13	87, 515	Gastric	11	125, 187
Diagnostic tests	4	50, 086	Lymphomata	2	26, 240
Genetics	6	50, 705	Leukemia	2	17, 700
Hormones	17	209, 761	Lung	1	13, 950
Immunology	5	67, 163	Mammary	1	5, 250
Metabolism	5	53, 993	Mouth	1	10, 260
Nutrition	5	24, 279	Nervous system	2	5, 007
Pathology	1	10, 800	Pigmentation, melanomas	3	15, 068
Biological and therapeutic effects	1	2, 000	Uterine	1	7, 000
Instruments	1	16, 536	Miscellaneous	3	18, 500

Many research projects could appropriately be classified under any one of several fields of investigation, so that this table does not express adequately the full scope of the projects receiving aid. Some of the research is fundamental laboratory work; some is clinical in nature; much is a combination of the two.

Many applications for grants to aid in constructing research facilities now await consideration by the Council. Only one has been recommended—$250,000 to assist in rebuilding the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine. This institution has not only made many valuable contributions to our fundamental knowledge of cancer through studies of mammalian genetics, but has been the principal source of laboratory animals of known genetic constitution. The dependence of many research problems upon adequate supplies of stock from this source placed a high priority on its rehabilitation. It is hoped that this and other construction grants will help to provide the new and expanded facilities that are so badly needed to permit clinical and fundamental laboratory studies to advance together.

Through grants-in-aid any suitable research institution can take part in cancer research. This makes it possible to use existing laboratory facilities and secures for the fight against cancer the ideas, experience and technical competence of men trained in a great variety of scientific disciplines.

As a means of expanding and expediting cancer research, either by bringing more laboratories and scientists into the cancer field, or by making possible increased productiveness of established research groups, the cancer research grants program is a powerful weapon in the battle against cancer.

Research Fellowships.—The Institute also awards research fellowships for the purpose of increasing the number of trained scientists from whose ranks men and women may be recruited to staff the laboratories in which cancer research is conducted. Under this program young scientists are given fellowships which permit them to take postgraduate training under the direction of a senior investigator in a branch of science in which studies of the cancer problem may be carried on. There were 109 research fellows on duty as of January 1, 1948.

CANCER CONTROL

Although the United States Public Health Service had aided cancer control activities in various ways previous to July 1, 1946, a nationwide government-supported cancer control program did not come into being until that date. The appropriation to the States Relations Division of the Public Health Service for the fiscal year 1947 included $2,500,000 which could be used for grants to States to support cancer control activities. It was not until the fiscal year 1948 that support of cancer control activities became part of the program of the National Cancer Institute. Again $2,500,000 was allotted for grants to States, and additional funds amounting to $3,277,000 were made available for other control activities, such as grants to support expanded cancer teaching programs in medical and dental schools, clinical traineeships, demonstrations, and grants for special cancer control projects. These allotments were part of the over-all appropriation of $14,000,000 to the National Cancer Institute.

Assistance to States.—Since a large part of the Federal appropriation for cancer control work was set aside for allotment to the State health authorities to be spent directly by them and local agencies and institutions, the first objective of the Federal program is to assist in the development of well-rounded State cancer control programs.

In anticipation of the inauguration of a nation-wide cancer control program, the National Advisory Cancer Council in 1944 appointed a committee to study and make recommendations on certain phases of the cancer problem. The report of this committee contains, among other things, an outline of the basic elements of a State cancer program and certain basic data for each State. The report was published in the April 1946 issue of the Journal of the National Cancer Institute and made available for the information and guidance of organizations and individuals engaged in, or planning, cancer control activities. In broad terms the basic elements of a cancer control program as outlined in the report are:

- The accumulation and analysis of data needed in planning and evaluating a program.
- Educational activities with—
  - The public.
  - Professional groups:
    - Physicians.
    - Nurses.
    - Dentists.
    - Students training in these professions.
    - Public health workers.
- Provision of medical facilities and services.
  - Preventive services:
    - Cancer detection centers.
  - Diagnostic facilities and services:
    - Tissue diagnostic services.
    - Cancer diagnostic clinics.
  - Treatment facilities and services:
    - Cancer clinics.
    - Hospital beds.
    - Consultation services.
  - Facilities and services for the advanced cancer patient:
    - Institutional facilities.
    - Home care facilities.
  - Integration of effort of all agencies to provide a complete program.

This report has served as a blueprint for the States in formulating their programs, since practically all control activities fall into one or another of the above categories. The types of activities to be undertaken in a State and their administrative patterns vary with local conditions and are therefore matters for local determination. Accordingly, a liberal policy has been adopted by the Public Health Service as to the activities that may be financed with the State allotments.

Direct assistance to the States in developing programs consists largely of consultation and advisory services, loans of personnel, and assistance in the training and recruitment of personnel for State staffs. A consultant in cancer control activities has been or will be added to the staff of each of the Public Health Service district offices to assist State staffs in any problems on which they wish consultant service and to act as liaison officers between the States and the Washington office.

Public health nurses on the district office staffs have been given special training in cancer control activities to prepare them to assist in the development of the nursing phases of the State programs. They are also prepared to conduct short courses and institutes on cancer nursing activities.

A staff of trained cancer control workers will also be assembled to form a pool from which workers may be detailed to the States to assist in the conduct of various programs or to substitute for State staff members while the latter are taking special orientation or training courses.

Other control activities.—The other activities in the Federal cancer control program are designed to gain new knowledge and to provide better techniques, facilities and services from which all agencies engaged in cancer control activities may draw in developing and carrying on their own programs. These activities are grouped around five main objectives: (1) The accumulation of new knowledge concerning the cancer problem, (2) education of professional and lay groups, (3) better utilization of present knowledge, (4) improvement and increase of medical services and facilities, and (5) evaluation of techniques and activities. The attainment of these objectives will require a diversity of projects and the cooperation of the many official, professional and lay organizations concerned with the cancer problem.

Many of the activities mentioned below will aid in attaining more than one of the objectives, but they are grouped according to the objective with which they are most directly concerned. All these activities, regardless of the immediate objective, have for their ultimate purpose the provision of more adequate cancer facilities and services. The most important factor in stimulating the program at present is the allotment of $2,500,000 to State health agencies. With these funds the State agencies are in a position to carry on any activity with their own staffs, to pay for services to cancer patients on a fee or contract basis, or to reallot their funds to other agencies which are in position to carry on some part of the program.

In addition to the financial support of the State activities, the National Cancer Institute will attempt to realize the objectives of the cancer control program by stimulating appropriate agencies to undertake cancer control activities or to expand their programs, by giving financial support to cancer projects, and by undertaking cooperative projects with other agencies. The diversity of activities required in the cancer control program is in proportion to the diversity of the problems involved in the control of the disease. No one agency can possibly cover the whole field, but through the integrated effort of all agencies a comprehensive program can be carried on and the objective of more adequate cancer facilities and services achieved.

THE ACCUMULATION OF MORE KNOWLEDGE CONCERNING THE CANCER PROBLEM

The planning and development of a cancer control program must be based on facts. Available data must be made more useful by study and analysis. Data not now available must be assembled. For example, we need to know whether there is a definite relationship between environment and cancer. Do diet, climate, or occupation have an effect on the incidence of the disease? If so, what are the favorable and unfavorable factors, and what can be done to control the unfavorable ones? In which industries are workers brought into contact with carcinogenic agents and how can they be protected against them? Why is there a higher incidence of cancer in some geographic areas than in others; does this variation pertain only to cancer of certain sites or to cancer of all sites? These and many other types of basic data are needed in the intelligent conduct of cancer control activities, and it is one of the objectives of the Federal program to see that such data are made available. Studies under way or contemplated include analyses of cancer mortality statistics, collection and analysis of cancer incidence statistics, studies of cancer epidemiology, and studies of types of facilities and services needed in providing care for the cancer patient. State health departments will be asked to cooperate in some of these studies, particularly in the collection of morbidity data in which the establishment of central cancer registers would be of great value.

EDUCATION OF PROFESSIONAL AND LAY GROUPS

The control of cancer can be brought about only by adequately trained professional groups, and by a public informed of the nature of the disease and the action to be taken if present diagnostic and treatment measures are to be made more effective.

The key figure in cancer control is the physician, and every effort will be made to provide the medical profession with opportunities for training in the diagnosis and treatment of the disease. Acting on the recommendation of the National Advisory Cancer Council, a grant-in-aid program has been undertaken to enable medical schools to develop better integrated courses in cancer for their students. Grants to 40 schools, amounting to approximately $900,000, had been recommended up to January 1, 1948. Since the establishment of the National Cancer Institute in 1937, a number of traineeships have been granted annually to properly qualified physicians to enable them to secure special training in the diagnosis and treatment of cancer. Seventy-five trainees were on duty on January 1.

In cooperation with the American Cancer Society, teaching materials are being prepared for the use of State and local medical groups. Other activities include assistance to State staffs in developing and conducting cancer teaching days and other short-term courses in cancer. Efforts will also be made to develop more hospital residencies in pathology, surgery and radiology in which cancer work receives the major emphasis.

In recognition of the important role that may be played by the dentist in the control of oral cancer, financial assistance is also being given to dental schools to assist them in developing courses in this subject. Twelve grants amounting to $60,000 have been given for this purpose.

The nursing section of the Cancer Control Branch will develop courses in cancer for public health nurses, to be given in local institutes. Schools of nursing and schools giving courses in public health nursing will be encouraged to incorporate appropriate courses in their curricula.

To promote the training of public health personnel, efforts will be made to establish short-term traineeships in cancer in cooperation with hospitals, universities and States with well-established cancer programs. Schools of public health and departments of preventive medicine in medical schools will be encouraged to include cancer in their courses. To meet the need for a limited number of public health administrators with special training in the administration of cancer control activities, efforts will be made to interest one or two schools in providing this training.

BETTER UTILIZATION OF PRESENT KNOWLEDGE ABOUT CANCER

It is generally agreed that if full use were made of present knowledge concerning cancer the disease could be cured in a much larger percentage of patients. All of the educational activities and the work directed at providing better cancer services and facilities mentioned above will aid in bringing about a fuller use of available knowledge concerning cancer. In addition, studies will be made to discover why patients delay in seeking treatment for cancer, and appropriate measures to overcome these factors will be planned in cooperation with appropriate medical groups and public health agencies. Interest in annual physical examinations will be stimulated. Films depicting the new cytologic test for the detection of early cancer are being made available for the use of medical groups in familiarizing their members with this test. Consultants in radiology and pathology will also be made available to assist groups in the States in developing greater interest in cancer diagnosis and in making diagnostic services easily available to practicing physicians. Assistance will be given State health departments in developing programs which will emphasize to physicians the need to be constantly on the alert for the signs and symptoms of cancer.

IMPROVEMENT AND INCREASE OF CANCER SERVICES AND FACILITIES

The educational activities mentioned above will also have the effect of improving the services rendered to cancer patients as they will increase both the competency of the personnel and their numbers.

Other activities directed at this objective include financial assistance in the development of tissue diagnostic services, in the establishment of additional cancer diagnostic and treatment clinics, and in the expansion of existing clinics through the addition of personnel and equipment. One of the first activities of this kind undertaken by the National Cancer Institute was loans of radium to hospitals which either had none of their own or did not have an adequate supply. This service has been carried on continuously since it was inaugurated and will be continued. Fifty-one hospitals have loans at the present time. The development of mobile diagnostic clinics and traveling teams of physicians with special competence in the diagnosis and treatment of cancer for consultation services to local clinics and individual physicians will be explored.

Studies of the types and amount of nursing services required for cancer patients in hospitals, convalescent homes and in their own homes will be made in order to improve the nursing care of cancer patients. Studies of socio-economic factors in relation to the cancer problem will be made in order to devise ways of developing and integrating State and local resources to provide assistance and services to persons needing them.

EVALUATION OF ACTIVITIES, TECHNIQUES, METHODS, AND SERVICES

Administrators of cancer control programs need information as to the efficiency, costs, and results of methods, techniques, types of service, and the value of the over-all program. Studies directed at determining these facts will be conducted in cooperation with national organizations such as the American College of Surgeons and the American Cancer Society, State and local medical societies and health agencies, and other appropriate groups.

Among the contemplated studies are the following:

(1) Study of report forms and statistical procedures used in detection centers and diagnostic and treatment centers to develop forms that can be used for collecting comparable data.

(2) Study of follow-up procedures used by cancer services to determine whether present methods are adequate or whether more effective follow-up work could be done.

(3) Study of the role of the public health nurse in follow-up activities to determine how follow-up of cancer patients may be correlated with other public health nursing activities.

(4) Study of types of hospital facilities for cancer patients to determine what kind of facilities are most satisfactory to patients of different income levels; also the type most suitable according to the population density of the area served.

(5) Study, in cooperation with a number of cancer detection clinics, of the periodic physical examination as a cancer control measure.

(6) Study, in cooperation with medical groups, of the effectiveness of various types of management of the cancer case, and also study of methods of increasing the salvage rate in advanced cancer cases.

Also, it is obvious that evaluation methods must be devised to determine the results of the over-all cancer program and to indicate where revisions need to be made and the activities on which greatest emphasis should be placed.

SUMMARY

The program of the National Cancer Institute is directed at two complementary objectives: (1) to try to find the ultimate solution of the cancer problem through research designed to give us a better understanding of the causes of cancer and more effective methods of diagnosis and treatment; and (2) to save as many lives as possible through the use of our present methods of diagnosis and treatment of cancer.

To attain the first objective, the Institute is conducting in its own laboratories numerous studies in the fields of biology, biochemistry, chemotherapy, endocrinology, biophysics, pathology, and biostatistics. Clinical studies are conducted in the cancer clinic of the United States Marine Hospital, Baltimore, Md., and in two other cooperating hospitals. A greatly expanded clinical research program is envisioned in the plans for a research hospital on the grounds of the National Institute of Health.

A research grants program supports cancer research in many different fields of investigation in a large number of laboratories throughout the United States, and in two foreign countries. These grants make it possible to bring into the cancer program already existing laboratories and some of the ablest investigators in various fields of science involved in the study of cancer. Grants to help expand and equip outside laboratories will be made in order to provide more research facilities.

Research fellowships are granted to provide larger numbers of trained scientists to staff cancer laboratories.

To attain the second objective, the Institute is carrying on a cancer control program. This program includes grants to State health agencies and other agencies and institutions to enable them to undertake or to expand cancer control programs, including the provision of more adequate cancer facilities and services for the cancer patient and studies to gain new knowledge applicable to cancer control problems; grants to medical and dental schools to provide more adequate training in cancer for medical and dental students; a clinical traineeship program to provide training in cancer diagnosis and treatment for physicians who wish to specialize in this field; loans of radium to hospitals; special studies and demonstrations; educational activities; consultant and advisory services; loans of personnel; and stimulation of cancer control activities by other agencies.

This over-all program represents the combined planning of the National Cancer Institute and the National Advisory Cancer Council. It has been designed to attack the cancer problem on all fronts and represents the best that can be evolved on the basis of our present knowledge and experience. The effectiveness of the program will be evaluated from time to time and changes made to conform to the new knowledge gained by the various activities.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED MARCH 27, 1948

Summary

A total of 4,642 cases of influenza was reported, as compared with 5,941 last week, a 5-year (1943–47) median of 3,477, and 52,115 for the corresponding week last year, the year's highest incidence. The current total, except for the week last year, is higher than reported for any corresponding week since 1941. Of 8 States reporting currently more than 86 cases, only 3 showed increases—West Virginia 115 (last week 103), Alabama 636 (last week 272), and California 196 (last week 108). The total for the year to date is 117,650, as compared with 157,694 for the same period last year, which latter figure was also the 5-year median for the period.

Of 33 cases of poliomyelitis reported (last week 30, corresponding week last year 31, 5-year median 27), only California, with 8 cases (last week 5), reported more than 3 cases. The total for the year to date is 381, as compared with a 5-year median of 425 and 643 for the same period last year.

The total of 100 cases of meningococcus meningitis reported for the week is the lowest number reported for a corresponding week since 1942. The total for the year to date is 1,040, as compared with 1,039 last year, the lowest number reported for a corresponding period of the past 5 years, 6,637, the highest, in 1944, and 3,016, the median, in 1945.

The figures for the year to date for amebic and undefined dysentery are above the corresponding 5-year medians, while the total for bacillary dysentery is below both the median and the figure for the corresponding period last year. Cumulative figures for infectious encephalitis, Rocky Mountain spotted fever, and undulant fever are slightly above the corresponding medians.

North Dakota reported 1 case of smallpox, and Louisiana and Texas each 1 case of leprosy.

A total of 9,634 deaths was recorded for the week in 92 large cities of the United States, as compared with 9,969 last week, 10,795 and 9,433, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1943–47) median of 9,436. The total for the year to date (13 weeks) is 132,665, as compared with 131,043 for the corresponding period last year. Infant mortality in the same cities totaled 679 deaths, as compared with 621 last week and a 3-year median of 695. The cumulative figure is 9,012, as compared with 10,518 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended March 27, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended— Mar. 27, 1948	Week ended— Mar. 22, 1947	Median 1943–47	Week ended— Mar. 27, 1948	Week ended— Mar. 22, 1947	Median 1943–47	Week ended— Mar. 27, 1948	Week ended— Mar. 22, 1947	Median 1943–47	Week ended— Mar. 27, 1948	Week ended— Mar. 22, 1947	Median 1943–47
NEW ENGLAND												
Maine	0	2	1	------	------	2	21	148	24	0	0	2
New Hampshire	0	0	0	------	2	1	5	6	6	0	2	1
Vermont	0	0	0	------	11	------	7	230	155	0	0	0
Massachusetts	4	22	3	------	------	------	1,084	376	761	2	0	6
Rhode Island	0	1	1	1	1	1	4	173	31	0	0	2
Connecticut	0	0	1	6	2	2	43	642	349	3	1	4
MIDDLE ATLANTIC												
New York	13	18	15	[1] 14	[1] 10	[1] 6	2,186	424	2,413	10	9	32
New Jersey	1	10	6	8	22	10	1,005	432	1,515	2	1	5
Pennsylvania	5	10	10	(2)	(2)	[2] 3	1,052	321	940	5	12	12
EAST NORTH CENTRAL												
Ohio	10	8	8	4	74	16	1,331	817	634	11	2	7
Indiana	7	13	7	9	179	10	734	48	262	0	2	5
Illinois	1	5	12	------	475	30	2,131	93	1,092	4	4	10
Michigan [3]	1	4	10	4	4	4	1,617	31	904	3	5	11
Wisconsin	1	0	5	86	537	70	1,401	291	1,260	2	1	3
WEST NORTH CENTRAL												
Minnesota	4	6	6	------	------	1	392	32	45	0	3	3
Iowa	2	2	2	------	2,321	------	326	29	133	1	2	1
Missouri	10	7	4	8	378	5	443	14	340	0	9	9
North Dakota	1	2	0	------	190	12	30	15	22	0	0	0
South Dakota	1	3	2	------	17	------	21	11	50	0	0	0
Nebraska	1	2	2	4	116	8	114	21	110	0	0	0
Kansas	4	6	5	27	1,947	4	41	7	760	1	3	5
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	82	1	29	1	2	1
Maryland [3]	4	8	8	8	23	6	141	22	91	1	2	5
District of Columbia	0	0	0	------	5	1	135	27	91	0	1	2
Virginia	4	5	5	343	1,439	442	157	299	687	1	3	10
West Virginia	7	2	2	115	2,589	8	406	34	73	3	1	3
North Carolina	8	8	8	------	------	------	8	248	248	2	2	9
South Carolina	2	0	3	435	1,814	539	90	128	128	0	1	1
Georgia	1	3	3	21	1,019	79	83	181	298	2	1	3
Florida	2	3	2	4	73	5	171	8	65	3	3	3
EAST SOUTH CENTRAL												
Kentucky	2	11	5	------	------	14	86	7	89	2	0	5
Tennessee	3	15	6	65	550	74	213	115	218	5	3	8
Alabama	*2	7	7	636	1,847	124	45	113	141	*1	4	8
Mississippi [3]	2	5	4	27	354	------	92	21	------	3	2	6
WEST SOUTH CENTRAL												
Arkansas	1	5	5	216	6,859	109	259	212	172	1	1	3
Louisiana	1	5	5	2	85	60	19	42	197	6	3	6
Oklahoma	2	5	5	34	7,624	125	38	------	74	3	3	2
Texas	14	20	37	2,064	19,087	1,243	2,062	216	1,359	6	6	8
MOUNTAIN												
Montana	11	3	1	------	565	22	56	136	136	0	0	1
Idaho	1	0	0	27	147	5	52	9	50	0	1	0
Wyoming	3	0	0	------	25	20	118	11	36	0	1	1
Colorado	3	7	7	36	921	29	568	43	367	0	0	0
New Mexico	3	2	2	------	12	4	11	61	33	0	0	0
Arizona	1	4	2	141	86	133	216	30	53	1	0	0
Utah [3]	4	0	0	27	81	29	34	3	116	0	0	0
Nevada	0	0	0	------	3	------	1	1	1	0	0	0
PACIFIC												
Washington	1	11	4	19	353	6	357	54	241	1	3	5
Oregon	1	0	1	55	241	30	64	32	98	0	0	1
California	11	27	25	196	27	85	2,061	214	1,226	14	7	20
Total	160	277	272	4,642	52,115	3,477	21,613	6,429	24,632	100	106	225
12 weeks	*2,546	3,510	3,510	117,650	157,694	157,694	175,422	62,501	184,225	*1,040	1,039	3,016
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	*8,904	11,076	12,123	161,208	190,669	190,669	210,368	85,388	212,665	*1,822	2,011	5,468

[1] New York City only.

[2] Philadelphia only.

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

* Delayed report (included in cumulative totals only): Alabama; diphtheria 1, meningitis 2.

Telegraphic morbidity reports from State health officers for the week ended March 2 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	Mar. 27, 1948	Mar. 22, 1947		Mar. 27, 1948	Mar. 22, 1947		Mar. 27, 1948	Mar. 22, 1947		Mar. 27, 1948[5]	Mar. 22, 1947	
NEW ENGLAND												
Maine	0	1	0	16	15	33	0	0	0	0	2	0
New Hampshire	0	0	0	1	11	11	0	0	0	0	0	0
Vermont	0	0	0	4	12	12	0	0	0	0	0	0
Massachusetts	0	0	0	184	140	380	0	0	0	1	3	2
Rhode Island	0	0	0	10	8	15	0	0	0	0	0	0
Connecticut	0	0	0	41	36	78	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	3	0	1	326	415	646	0	0	0	1	3	5
New Jersey	2	0	0	91	143	160	0	0	0	2	2	1
Pennsylvania	1	2	2	354	231	451	0	0	0	3	2	2
EAST NORTH CENTRAL												
Ohio	0	0	0	379	469	447	0	0	1	0	1	2
Indiana	1	0	0	59	136	136	0	0	1	0	1	3
Illinois	1	3	1	110	175	224	0	0	0	1	1	1
Michigan[3]	0	0	0	230	168	168	0	0	0	2	1	1
Wisconsin	1	0	0	55	97	294	0	0	0	0	1	1
WEST NORTH CENTRAL												
Minnesota	1	0	0	52	72	72	0	0	0	0	0	0
Iowa	0	0	0	29	53	67	0	0	0	0	0	0
Missouri	0	1	0	30	64	82	0	0	0	1	0	2
North Dakota	0	4	0	2	13	15	1	0	0	0	0	0
South Dakota	1	0	0	7	15	15	0	0	0	0	0	0
Nebraska	1	3	0	24	42	42	0	2	0	0	0	0
Kansas	1	0	0	58	32	87	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	9	14	14	0	0	0	0	0	0
Maryland[3]	0	0	0	35	55	107	0	0	0	0	0	0
District of Columbia	0	0	0	11	6	25	0	0	0	0	0	0
Virginia	0	1	1	25	53	121	0	0	0	2	1	1
West Virginia	0	0	0	24	10	39	0	0	0	0	0	0
North Carolina	3	0	0	17	35	35	0	0	0	0	0	2
South Carolina	1	0	0	7	5	9	0	0	0	0	3	0
Georgia	0	0	0	20	8	14	0	0	0	9	0	3
Florida	0	0	0	9	14	7	0	0	0	2	1	1
EAST SOUTH CENTRAL												
Kentucky	0	0	0	24	56	55	0	0	0	3	1	1
Tennessee	0	0	0	29	72	64	0	0	0	2	0	0
Alabama	*2	0	0	10	30	17	0	0	0	1	0	0
Mississippi[3]	1	0	0	3	15	16	0	0	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas	0	1	0	4	1	15	0	0	0	0	0	1
Louisiana	0	1	1	3	2	10	0	1	0	5	0	5
Oklahoma	0	0	0	17	14	16	0	0	0	0	0	1
Texas	3	1	4	51	38	61	0	0	0	8	2	3
MOUNTAIN												
Montana	0	0	0	10	6	9	0	0	0	2	0	0
Idaho	1	0	0	5	11	11	0	0	0	0	0	0
Wyoming	0	0	0	2	4	17	0	0	0	0	0	0
Colorado	0	0	0	26	61	60	0	0	0	1	2	0
New Mexico	0	0	0	12	2	14	0	1	0	0	0	1
Arizona	0	0	0	11	7	17	0	0	0	1	1	1
Utah[3]	0	0	0	25	20	47	0	0	0	0	0	0
Nevada	0	0	0	4	0	1	0	0	0	0	0	0
PACIFIC												
Washington	1	1	1	89	59	59	0	0	0	0	5	1
Oregon	0	0	0	15	15	19	0	0	0	2	0	0
California	8	12	3	108	143	200	0	0	0	0	3	2
Total	33	31	27	2,667	3,103	4,107	1	4	8	49	36	50
12 weeks	*381	643	425	28,705	32,977	46,702	33	49	118	522	521	638
Seasonal low week[4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	33	31	24	51,244	59,663	85,023	54	103	201	49	36	53

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately, as follows: Massachusetts 1 (salmonella infection), Michigan 1, Virginia 1, Georgia 8, Texas 6, Oregon 1.

*Delayed report (included in cumulative totals only): Poliomyelitis, Alabama, 1 case.

Telegraphic morbidity reports from State health officers for the week ended March 27, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended March 27, 1948							
	Week ended—		Median 1943–47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Mar, 27. 1948	Mar, 22, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	30	11	30								
New Hampshire	5	8	1								
Vermont	51	17	19								4
Massachusetts	49	171	171		2						
Rhode Island	12	14	19								
Connecticut	24	54	54								
MIDDLE ATLANTIC											
New York	128	177	177	11	3		3			1	5
New Jersey	72	118	118								
Pennsylvania	96	202	197								3
EAST NORTH CENTRAL											
Ohio	100	108	108						1		2
Indiana	38	46	17		1		2		1		1
Illinois	39	52	55	10			1				4
Michigan [3]	86	166	119	7							1
Wisconsin	82	107	95	3							10
WEST NORTH CENTRAL											
Minnesota	7	7	16								
Iowa	19	18	18								7
Missouri	27	22	22						4		1
North Dakota	8		1	9							
South Dakota	11		1								
Nebraska	1	15	10								
Kansas	64	6	30				1				2
SOUTH ATLANTIC											
Delaware	2	4	4								
Maryland [3]	22	67	50			2					1
District of Columbia	15	4	7								
Virginia	37	75	74			89					3
West Virginia	18	13	16								
North Carolina	31	36	151	2					1	1	1
South Carolina	88	24	52	1	2						
Georgia	16	8	11		4				3	1	4
Florida	12	25	22	1						2	2
EAST SOUTH CENTRAL											
Kentucky	11	9	20								
Tennessee	57	34	34	1		1					1
Alabama	48	67	25	(*)						2	1
Mississippi [3]	1	11							2		1
WEST SOUTH CENTRAL											
Arkansas	35	14	14	1		1			3		3
Louisiana	14	3	2	4						1	
Oklahoma	44	14	12								1
Texas	430	549	261	11	219	23				5	11
MOUNTAIN											
Montana	14		4								
Idaho	15	3	3								
Wyoming	6		2								2
Colorado	92	21	32	1							9
New Mexico	21	1	2								
Arizona	64	9	19			9					1
Utah [3]	3	5	27								6
Nevada											
PACIFIC											
Washington	36	42	28								1
Oregon	25	32	14	4	1						3
California	92	191	191	7	13				1		4
Total	2,198	2,580	2,580	73	245	125	7	0	16	13	95
Same week: 1947	2,580			42	314	143	7	2	30	35	93
Median, 1943–47	2,580			37	202	100	11	0	15	38	[6] 93
12 weeks: 1948	26,857			*750	3,022	2,473	111	6	224	172	1,087
1947	30,499			546	4,054	2,679	81	12	468	543	1,205
Median, 1943–47	29,090			332	3,459	1,312	97	4	226	576	[6] 1,014

[3] Period ended earlier than Saturday.

[6] 3-year median 1945–47.

*Delayed report (included in cumulative total only): Amebic dysentery, Alabama 1 case.

Territory of Hawaii: Rabies 0, bacillary dysentery 3, measles 3, leprosy 1, whooping cough 17.

Leprosy: Louisiana 1; Texas 1.

WEEKLY REPORTS FROM CITIES *

City reports for week ended March 20, 1948

This table lists the reports from 90 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	2	0	2	0	1	0	0	------
New Hampshire:												
Concord	0	0	------	0	------	0	0	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	6	0	------	0	299	0	8	0	54	0	0	10
Fall River	0	0	------	0	2	0	1	0	0	0	0	5
Springfield	0	0	------	0	------	0	1	0	3	0	0	3
Worcester	0	0	------	0	2	0	10	0	15	0	0	7
Rhode Island:												
Providence	0	0	------	0	------	0	0	0	6	0	0	8
Connecticut:												
Bridgeport	0	0	3	0	------	0	0	0	0	0	0	------
Hartford	0	0	------	0	3	0	0	0	3	0	0	------
New Haven	0	0	5	0	3	0	0	0	8	0	0	4
MIDDLE ATLANTIC												
New York:												
Buffalo	0	2	------	0	9	0	2	0	14	0	0	9
New York	5	3	19	2	1,464	3	109	1	112	0	0	30
Rochester	0	0	------	0	------	0	5	0	8	0	0	------
Syracuse	0	0	------	0	13	1	3	0	14	0	0	10
New Jersey:												
Camden	0	0	1	0	20	0	3	0	1	0	0	------
Newark	1	0	4	0	109	0	4	0	7	0	0	5
Trenton	0	0	3	0	1	0	2	0	6	0	0	------
Pennsylvania:												
Philadelphia	2	0	1	0	451	3	21	0	52	0	1	15
Pittsburgh	0	0	1	1	1	1	8	0	24	0	0	3
Reading	0	0	------	0	8	0	2	0	10	0	0	2
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	47	3	7	0	14	0	0	8
Cleveland	1	0	5	0	3	1	9	0	49	0	0	14
Columbus	1	0	------	0	158	0	4	0	2	0	0	------
Indiana:												
Fort Wayne	0	0	------	0	24	0	0	0	3	0	0	1
Indianapolis	0	0	------	0	325	0	7	0	11	0	0	2
South Bend	0	0	------	0	------	0	0	0	1	0	0	1
Terre Haute	0	0	------	1	------	0	1	0	0	0	0	------
Illinois:												
Chicago	0	0	------	0	845	2	29	1	46	0	0	21
Springfield	0	0	------	1	169	0	3	0	2	0	0	------
Michigan:												
Detroit	1	0	------	0	264	1	7	0	82	0	0	22
Flint	0	0	------	0	2	1	3	0	2	0	0	------
Grand Rapids	0	0	------	0	267	0	1	0	1	0	0	4
Wisconsin:												
Kenosha	0	0	------	0	124	0	0	0	0	0	0	------
Milwaukee	0	0	------	0	33	0	1	0	20	0	0	5
Racine	0	0	------	0	242	0	0	0	1	0	0	1
Superior	2	0	------	0	63	0	2	0	2	0	0	------
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	79	0	1	0	3	0	0	3
Minneapolis	0	0	------	0	40	0	3	0	4	0	0	10
St. Paul	1	0	------	0	63	0	5	0	7	0	0	1
Missouri:												
Kansas City	0	0	1	0	21	0	6	0	5	0	0	15
St. Joseph	0	0	------	0	------	0	0	0	1	0	0	------
St. Louis	3	0	------	0	222	1	7	0	24	0	0	14

---

* In some instances the figures include nonresident cases.

City reports for week ended March 20, 1948—Continued

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	4	0	0	0	4	0	0	------
Nebraska:												
Omaha	0	0	------	0	71	0	2	0	2	0	0	------
Kansas:												
Topeka	0	0	------	0	16	0	1	0	4	0	0	------
Wichita	0	0	------	0	4	0	2	0	3	0	0	25
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	27	0	1	0	6	0	0	------
Maryland:												
Baltimore	1	0	5	0	25	0	8	0	16	0	0	7
Cumberland	1	0	------	0	------	0	1	0	6	0	0	------
Frederick	1	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	148	0	11	0	13	0	0	6
Virginia:												
Richmond	0	0	------	0	1	1	4	0	1	0	0	12
Roanoke	0	0	------	0	------	0	0	0	2	0	0	------
West Virginia:												
Charleston	2	0	------	0	3	0	5	0	0	0	0	------
Wheeling	0	0	------	0	9	0	0	0	0	0	0	------
North Carolina:												
Raleigh	0	0	------	0	2	0	1	0	1	0	0	------
Wilmington	0	0	------	0	------	0	0	0	1	0	0	------
Winston-Salem	0	0	------	0	2	0	2	0	0	0	0	------
South Carolina:												
Charleston	0	0	41	2	------	0	3	0	0	0	0	2
Georgia:												
Atlanta	0	0	------	0	2	0	3	0	10	0	1	1
Brunswick	0	0	------	0	1	0	0	0	1	0	0	6
Savannah	0	0	1	1	------	0	2	0	0	0	0	1
Florida:												
Tampa	0	0	------	0	12	1	3	0	0	0	0	2
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	1	0	190	0	5	0	5	0	0	3
Nashville	0	0	------	0	------	0	0	0	0	0	0	------
Alabama:												
Birmingham	1	0	------	0	4	0	3	0	3	0	0	5
Mobile	0	0	14	1	------	0	4	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	4	0	------	0	1	0	0	0	0	------
Louisiana:												
New Orleans	0	0	6	2	2	2	9	0	3	0	1	6
Shreveport	0	0	------	0	------	0	6	0	0	0	1	------
Oklahoma:												
Oklahoma City	0	0	33	0	3	0	3	0	5	0	0	1
Texas:												
Dallas	0	0	------	0	132	0	4	0	6	0	0	10
Galveston	0	0	------	0	1	0	2	0	1	0	0	------
Houston	1	0	7	0	46	0	6	0	3	0	0	4
San Antonio	0	0	3	4	10	1	5	0	0	0	0	5
MOUNTAIN												
Montana:												
Billings	0	0	------	0	1	0	1	0	0	0	0	------
Great Falls	0	0	------	0	------	0	2	2	1	0	0	------
Helena	0	0	------	0	1	0	0	0	0	0	0	5
Missoula	0	0	------	0	4	0	0	0	3	0	0	------
Idaho:												
Boise	0	0	3	0	------	0	0	0	0	0	0	------
Colorado:												
Denver	3	0	5	0	403	0	5	0	6	0	0	21
Pueblo	0	0	------	0	44	0	3	0	6	0	0	12
Utah:												
Salt Lake City	0	0	------	0	16	0	2	0	4	0	0	------

City reports for week ended March 20, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	22	0	5	0	11	0	0	5
Spokane	0	0	1	1	3	0	0	0	5	0	0	------
Tacoma	0	0	------	0	64	0	0	0	1	0	0	------
California:												
Los Angeles	3	0	18	1	156	2	3	0	14	0	0	16
Sacramento	1	0	1	0	10	0	2	0	1	0	0	1
San Francisco	0	0	3	0	331	0	5	2	12	0	0	17
Total	37	5	189	17	7,148	24	402	6	778	0	4	401
Corresponding week, 1947 [1]	76	------	603	33	1,689	------	491	------	789	0	11	663
Average 1943-47 [1]	69	------	239	[2] 32	[3] 6,312	------	[2] 433	------	1,600	1	11	640

[1] Exclusive of Oklahoma City.
[2] 3-year average 1945-47.
[3] 5-year median 1943-47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 90 cities in the preceding table (latest available estimated population, 34,591,500)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	15.7	0.0	20.9	0.0	813	0.0	57.5	0.0	235	0.0	0.0	84
Middle Atlantic	3.7	2.3	13.4	1.4	961	3.7	73.6	0.5	115	0.0	0.5	34
East North Central	3.0	0.0	3.0	1.2	1,560	4.9	45.0	0.6	144	0.0	0.0	48
West North Central	8.0	0.0	2.0	0.0	1,034	2.0	53.7	0.0	113	0.0	0.0	135
South Atlantic	8.3	0.0	77.8	5.0	384	3.3	72.8	0.0	94	0.0	1.7	61
East South Central	5.9	0.0	88.5	5.9	1,145	0.0	70.8	0.0	47	0.0	0.0	47
West South Central	2.5	0.0	134.6	15.2	493	7.6	91.4	0.0	46	0.0	5.1	66
Mountain	23.8	0.0	63.5	0.0	3,725	0.0	103.3	15.9	159	0.0	0.0	302
Pacific	6.3	0.0	36.4	3.2	927	3.2	23.7	3.2	70	0.0	0.0	62
Total	5.6	0.8	28.6	2.6	1,080	3.6	60.8	0.9	118	0.0	0.6	61

Dysentery, amebic.—Cases: New York 10, Cleveland 1, Springfield 1, Memphis 4, New Orleans 3, Los Angeles 4.

Dysentery, bacillary.—Cases: Chicago 1.

Dysentery, unspecified.—Cases: Baltimore 1, San Antonio 1.

Tularemia.—Cases: Barre 1, Memphis 2.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended March 6, 1948.—During the week ended March 6, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox	-	44	-	187	374	59	24	29	120	837
Diphtheria	-	-	-	1	2	2	1	3	-	9
Dysentery, bacillary	-	-	-	-	-	-	-	-	4	4
German measles	-	-	-	51	26	-	2	6	10	95
Influenza	-	32	-	-	9	-	-	-	229	270
Measles	-	1	-	817	1, 246	2	-	24	106	2, 196
Meningitis, meningococcus	-	-	-	-	1	-	-	-	-	1
Mumps	-	22	1	262	321	32	62	43	20	763
Poliomyelitis	-	-	-	-	-	1	-	-	-	1
Scarlet fever	-	2	2	50	79	5	2	3	20	163
Tuberculosis (all forms)	-	7	26	107	39	29	1	2	27	238
Typhoid and paratyphoid fever	-	-	-	7	1	-	-	1	5	14
Undulant fever	-	-	-	2	2	-	-	-	-	4
Venereal diseases:										
Gonorrhea	2	10	9	65	56	27	21	34	102	326
Syphilis	-	5	4	89	42	14	10	10	40	214
Other forms	-	-	-	-	-	-	-	-	2	2
Whooping cough	-	-	-	20	28	6	4	36	10	104

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

India—Calcutta.—For week ended March 13, 1948, 208 cases of cholera were reported in Calcutta, India.

India (French)—Karikal.—For the month of February 1948, 208 cases of cholera were reported in Karikal, French India.

Pakistan—Chittagong.—For the week ended March 13, 1948, 17 cases of cholera were reported in Chittagong, Pakistan.

Plague

Argentina—Buenos Aires Province—El Tigre.—For the month of February 1948, 2 cases of plague were reported in El Tigre, Buenos Aires Province, Argentina.

Smallpox

British East Africa—Nyasaland.—During the week ended February 7, 1948, 273 cases of smallpox with 37 deaths were reported in Nyasaland, including 34 cases with 4 deaths in Cholo, 39 cases with 13 deaths in Fort Johnston, and 45 cases with 9 deaths in Liwonde. For the week ended February 21, 1948, 61 cases of smallpox with 45 deaths were reported in Blantyre.

Chile—Antofagasta (vicinity of).—For the week ended March 13, 1948, 3 cases of smallpox with 1 death were reported in the vicinity of Antofagasta, Chile.

China—Shanghai.—For the week ended March 13, 1948, 138 cases of smallpox were reported in Shanghai, China.

Tunisia.—Smallpox has been reported in Tunisia as follows: January 1948, 254 cases including 49 cases in Gabes and 106 cases in Tunis; February 1948, 145 cases including 57 cases in Tunis.

Typhus Fever

Tunisia.—Typhus fever has been reported in Tunisia as follows: February 1–10, 1948, 23 cases; February 11–20, 1948, 18 cases; February 21–29, 1948, 49 cases.

Yellow Fever

Ivory Coast—Gagnao.—On March 12, 1948, 1 fatal case of yellow fever was reported in Gagnao, Ivory Coast.

DEATHS DURING WEEK ENDED MAR. 20, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Mar. 20, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	10,004	10,186
Median for 3 prior years	9,640	----------
Total deaths, first 12 weeks of year	123,298	120,645
Deaths under 1 year of age	624	721
Median for 3 prior years	650	----------
Deaths under 1 year of age, first 12 weeks of year	8,350	9,731
Data from industrial insurance companies:		
Policies in force	71,165,108	67,330,226
Number of death claims	15,487	12,969
Death claims per 1,000 policies in force, annual rate	11.4	10.0
Death claims per 1,000 policies, first 12 weeks of year, annual rate	10.4	9.8

ANNOUNCEMENT

REGULAR CORPS APPOINTMENTS FOR ENGINEER OFFICERS IN THE PUBLIC HEALTH SERVICE

Competitive examinations for approximately 15 appointments in the Regular Corps in the Public Health Service in grades of Assistant Sanitary Engineer (1st Lieutenant) and Senior Assistant Sanitary Engineer (Captain) will be held during June 1948.

A Regular Corps appointment provides an opportunity for a qualified engineer to make a life career of engineering as it relates to the protection and promotion of the public health. Assignments are made with consideration of the officer's abilities and experience. Such assignments include general sanitary engineering, industrial hygiene, malaria and typhus control, milk and food sanitation and research.

Entrance pay for the Assistant grade with dependents is $3,811 a year and for the Senior Assistant grade with dependents is $4,351 a year. Promotions are made at regular intervals up to and including the grade of Senior Sanitary Engineer, which corresponds to the rank of Lieutenant Colonel, at $7,018 a year. Promotion to grades above Senior Sanitary Engineer is by selection. Retirement pay after 30 years service or at the age of 64 is $4,950 a year. Full medical care including disability retirement at three-fourths base pay and 30 days annual leave with pay are provided.

An applicant for the Assistant grade must (1) be a citizen of the United States at least 21 years of age, (2) have a degree in one of the several branches of engineering, from a school of recognized standing, and (3) have had at least 7 years of educational (exclusive of high school) and professional training or experience. At least 2 of the 7 years shall be qualifying professional training or experience in the field of public health or in an acceptable related field.

An applicant for the Senior Assistant grade must meet requirements (1) as stated for the Assistant grade, and (2) have had 11 years of education (exclusive of high school) and professional training or experience. At least 6 of the 11 years shall be qualifying professional training or experience in the field of public health in an official or non-official health agency or in an activity directly related to the field of public health.

Each applicant will receive a physical examination by a medical officer of the Public Health Service and a written examination, and will be rated by a Board of Officers as to professional knowledge and general fitness.

The written professional examination for the Assistant grade will be in the following subjects as they relate to courses of study generally provided in engineering schools of recognized standing and to professional training and experience required for this grade: (1) Basic science principles (including chemical, biological, physical, and social sciences), (2) basic science application, (3) engineering practices, (4) public health methods and procedures, and (5) specialty.

The written professional examination for the Senior Assistant grade will be in the same subjects listed for the Assistant grade as they relate to air hygiene, water, liquid and solid wastes, milk and food and vector control.

Application forms and information may be obtained from the Surgeon General, Public Health Service, Washington 25, D. C. Applications must be submitted prior to June 1, 1948. The written examination is scheduled for June 21, 22 and 23. Examinations will be held at designated Service stations convenient to candidates. Applicants will be notified of the date and location of the oral examinations. The applicants must assume transportation expenses and cost of maintenance at the place of examination. The written examination will require approximately 3 days.

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. : 1948

For sale by the Superintendent of Documents, Washington 25, D.C.

Price 10 cents. Subscription price $4.00 a year

Public Health Reports

VOLUME 63 APRIL 23, 1948 NUMBER 17

IN THIS ISSUE

Serologic Screening Tests in Typhus Fever

Statistical Studies of Heart Diseases, I

FEDERAL SECURITY AGENCY

PUBLIC HEALTH SERVICE

FEDERAL SECURITY AGENCY
OSCAR R. EWING, *Administrator*

PUBLIC HEALTH SERVICE
LEONARD A. SCHEELE, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS
G. ST. J. PERROTT, *Chief of Division*

CONTENTS

	Page
Employment of soluble antigen in screening tests for typhus complement fixation. T. O. Berge	529
Statistical studies of heart diseases, Part I. Heart diseases and allied causes of death in relation to age changes in the population. I. M. Moriyama and Mary Gover	537

INCIDENCE OF DISEASE

United States:	
Reports from States for week ended April 3, 1948, and comparison with former years	546
Weekly reports from cities:	
City reports for week ended March 27, 1948	550
Rates, by geographic divisions, for a group of selected cities	552
Territories and possessions:	
Puerto Rico—Notifiable diseases—4 weeks ended February 28, 1948	553
Deaths during week ended March 27, 1948	553
Foreign Reports:	
Canada—Provinces—Communicable diseases—Week ended March 13, 1948	554
Japan—Notifiable diseases—4 weeks ended February 28, 1948	554
Norway—Notifiable diseases—December 1947	555
Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—	
Cholera	555
Plague	555
Smallpox	556
Typhus fever	556
Yellow fever	556

Public Health Reports

Vol. 63 • APRIL 23, 1948 • *No. 17*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

EMPLOYMENT OF SOLUBLE ANTIGEN IN SCREENING TESTS FOR TYPHUS COMPLEMENT FIXATION

By T. O. BERGE, *Major, MSC, U. S. Army*[1]

Purification of rickettsial suspensions from infected yolk sacs by the ethyl-ether extraction technic was first described by Craigie in a confidential report submitted in 1942 and later published in 1945 (*1*). The development of this method paved the way for greatly simplified technics for the preparation of highly specific rickettsial antigens and of nonspecific soluble antigens which have been increasingly employed in studies concerning serological relationships between various rickettsial strains and groups.

Topping and Shear (*2*) soon noted that treatment of typhus infected yolk sacs by the ether method caused a release of soluble antigen into the aqueous fraction remaining in the supernatant fluid after high speed centrifugation to remove rickettsial bodies. This antigen proved capable of causing positive complement-fixation reactions and immunity in guinea pigs and strongly positive Weil-Felix response in rabbits. Plotz (*3*) found that while the soluble antigen liberated from typhus rickettsiae by ether extraction of infected yolk sacs gave strong cross-fixation with both epidemic and murine convalescent sera, the sedimented rickettsial bodies, after several washings in neutral buffered saline, showed a high degree of specificity. Topping and Shepard (*4*) reported that large quantities of antigen released by ether extraction and contained in the supernate after centrifugation were found with yolk sac preparations of both *Rickettsia prowazeki* and *R. mooseri*, whether the yolk sac suspensions were treated directly or first centrifuged to sediment the rickettsiae before treatment with ether. With *R. rickettsi* a lesser amount of soluble antigen was also released by ethyl ether extraction, while with *R. burneti* and *R. orientalis* there was no release at all and an actual loss in antigen titer resulted.

When rickettsial suspensions were first washed by centrifugation and most of the remaining yolk sac material removed by absorption with celite, Shepard and Topping reported (*5*) that no liberation of soluble antigen occurred following ether treatment of the prepared suspensions. However, soluble antigen was liberated by ether when normal yolk sac material was added to the purified suspensions.

---

[1] From the Virus and Rickettsial Section, 406th Medical General Laboratory.

Fulton and Begg (*6*) also reported the presence of soluble antigen in purified rat lung murine rickettsial suspensions after storage for 1 month at 4°C. although purified mouse lung suspensions were deficient or lacking in soluble antigen when freshly purified. Significant release of soluble antigen occurred following ether treatment both in purified mouse lung suspensions of murine rickettsiae and in yolk sac emulsions of epidemic typhus rickettsiae. It was considered probable that the soluble antigen was derived from the surface antigen of the rickettsiae.

This view was confirmed by the work of Shepard and Wyckoff (*7*) in which they demonstrated with the aid of the electron microscope that the filter-passing soluble antigen released from suspensions of typhus rickettsiae by ether treatment consisted of sub-microscopic particles of a capsular substance adhering to and partially enveloping the rickettsiae. Liberation of particles from the capsular substance was found to be much more active and complete with warm ether treatment than with cold ether extraction.

Soluble antigen prepared from epidemic strains (Breinl, Cairo, Madrid No. 4) and murine strains (Castaneda, Wilmington) of typhus rickettsiae have been found to show positive complement-fixation reactions with the heterologous as well as homologous immune sera of guinea pigs (*6, 8, 9*). Wishart and Malcomson (*9*) noted that with both epidemic and murine serum, the titer with homologous soluble antigen was higher than with heterologous or heated antigens. When either epidemic or murine serum was absorbed with epidemic rickettsiae previously heated at 65° C., the antibody responsible for the cross-reaction and for reactions with heated antigen was removed from both types of serum. An antibody which reacted only with homologous unheated antigen remained. Absorption of immune serum with homologous unheated rickettsiae removed all antibodies from the serum. Absorption of murine serum with epidemic rickettsiae had no effect upon the titer for murine antibody after an initial reduction due, presumably, to removal of common antibody from the serum. Similarly, absorption of epidemic serum with murine rickettsiae had only slight effect upon epidemic antibody titer. The specific antigen appeared to be identical for both the Breinl and Madrid strains of epidemic rickettsiae. Specific antibody was removed only by absorption with the homologous type of antigen, while "common antibody" was absorbed either by heterologous rickettsiae or by heated homologous rickettsiae. Antigens stable to 65° C. heat (common antigen) were identical for Castaneda murine and Breinl or Madrid epidemic strains.

Commercially prepared typhus vaccines of the Cox-Craigie type have been found to be useful as diagnostic antigens for complement-fixation tests (*10*, *11*). Such vaccines are known to owe a large part of their antigenic activity to the presence of soluble antigen. However, soluble antigen as such, does not appear to have been widely employed in routine typhus complement-fixation procedures. This may be due in part to the fact that such antigen lacks specificity and thus cannot be used to differentiate between epidemic and murine antibodies, and in part because such antigen may show false positive reactions with Wassermann-positive sera when primary incubation is carried out for 18 hours in the cold (*12*, *13*).

Antibody titers against soluble antigen have been determined in this laboratory in almost a thousand complement-fixation tests concurrently with specific rickettsial epidemic (Breinl) and murine (Wilmington) antibody titers, employing antigens prepared from a variety of typhus strains. Results of these tests have made it evident that whenever epidemic or murine positive titers are obtained using specific rickettsial antigens, positive reactions are also obtained employing soluble antigens from either epidemic or murine typhus yolk sac strains. Furthermore, in several instances (unpublished data 1947) where positive diagnoses of murine typhus have been made on the basis of epidemiological and clinical observations, Weil-Felix reactions and rickettsial agglutination tests, soluble antibody complement-fixation titers have been found to be as high as 1:2560 while specific murine titers remained negative or reached a maximum of 1:40. Serological tests were carried out in three different laboratories. Kahn and Kolmer tests in these instances were negative.

The preparation of specific complement-fixing rickettsial antigens involves considerable expense and a high degree of technical skill. As a byproduct in the preparation of such antigens by the ether extraction method using rickettsial yolk sac cultures, a relatively large quantity of soluble antigen may be obtained. Employment of the comparatively easily prepared soluble antigen in the preliminary testing of sera suggests the possibility of conserving highly specific antigens in large-scale typhus serologic studies such as typhus incidence surveys. To be of value in serum "screening" tests, use of soluble antigen should permit elimination of anticomplementary sera and of all sera lacking in specific complement-fixing antibodies, and at the same time permit detection of all sera in which such antibodies are present. If, as has been indicated by previous work, antibody titers with soluble antigen were as high or higher than antibody titers with specific antigens, quantitative or semiquantitative screening tests with soluble antigen should serve to estimate closely the maximum titers which might be expected in subsequent quantitative tests with specific antigens.

MATERIALS AND METHODS

Soluble antigens were prepared from Breinl epidemic and Wilmington murine typhus rickettsiae obtained from the Army Medical Department Research and Graduate School, and from the Ishii and Uchída epidemic typhus strains isolated in the Tokyo field laboratory of the United States of America Typhus Commission during the 1946–1947 typhus season. Infected yolk sacs were ground in a Waring blendor and brought to a 10 or 20 percent emulsion in M/75 phosphate-buffered saline (ph 7.2) containing 0.3 percent formalin. After standing for 24 to 48 hours at 4° C. to 8° C. for inactivation of the rickettsiae, the suspensions were shaken in a separatory funnel with 1½ volumes of ethyl ether, left at room temperature for 4 to 6 hours, and the aqueous portion drawn off. A second extraction was then made with ½ volume of ether and the aqueous layer again drawn off when separation appeared to be complete. The supernate remaining after centrifugation for 30 minutes at 12,000 r. p. m. was employed as the soluble antigen after removal of excess ether by partial vacuum. Specific rickettsial antigens were obtained through the Army Medical Center.

An epidemic immune serum pool was obtained from convalescent guinea pigs inoculated with a single dose of Breinl guinea pig brain passage material. Murine immune serum was similarly obtained from guinea pigs recovered from a single injection of tunica washings from guinea pig Wilmington strain passage material. The complement-fixation technic used throughout was essentially that recommended by the Division of Virus and Rickettsial Diseases, Army Medical Department Research and Graduate School, employing two-fold serial dilutions of serum in 0.25 cc., 2 units of antigen in 0.25 cc., 2 full units of complement in 0.5 cc., fixation overnight in the refrigerator followed by 15 minutes at room temperature, addition of 0.5 cc. of 3 percent washed sheep cells sensitized with an equal volume of amboceptor diluted to contain 3 hemolytic units in 0.25 cc., and secondary incubation for 30 minutes at 37° C. in the water bath. Serum, antigen and hemolytic system controls were always included. Secondary complement titration in the cold was invariably performed.

Titrations of immune serum were made by testing increasing dilutions of serum against increasing dilutions of homologous soluble antigen and considering the highest dilution of serum showing 3 or 4 plus fixation in the presence of the greatest dilution of antigen as one unit. The highest dilution of each epidemic antigen giving 3 or 4 plus fixation in the presence of 4 units of Breinl antiserum was then taken as one unit of antigen. Murine antigens were titrated in the same way against 4 units of Wilmington antiserum. Dilutions of sera in titrations were made in increments not greater than 1:50, while antigens were diluted in increments of 1:20. None of the anti-

TABLE 1.—*Complement fixation cross titration of guinea pig epidemic and murine antiserum against epidemic and murine soluble and specific rickettsial antigens*

ANTISERUM			UNITS OF ANTIGEN																															
	Dilution	Units of serum	Breinl soluble				Ishii soluble				Uchida soluble				Wilmington soluble				Breinl specific AMS				Epidemic specific Parke-Davis				Wilmington specific AMS				Murine specific Parke-Davis			
			4	2	1	½	4	2	1	½	4	2	1	½	4	2	1	½	4	2	1	½	4	2	1	½	4	2	1	½	4	2	1	½
Epidemic (Breinl) guinea pig pool	20	16	4	4	4	4	4	4	4	3	4	4	4	—	4	4	4	—	4	4	4	0	4	4	4	1	—	0	0	0	0	0	0	0
	40	8	4	4	4	3	4	4	4	1	4	4	4	—	4	4	2	—	4	4	4	±	4	4	4	±	—	0	0	0	0	0	0	0
	80	4	4	4	4	1	4	4	4	±	4	4	3	—	3	1	0	—	4	4	4	0	4	4	4	±	—	0	0	0	0	0	0	0
	160	2	4	4	4	±	4	4	3	0	4	4	1	—	0	0	0	—	4	4	3	0	4	4	4	±	—	0	0	0	0	0	0	0
	320	1	4	4	4	0	4	4	2	0	4	3	1	—	0	0	0	—	1	0	0	0	1	0	0	0	—	0	0	0	0	0	0	0
	640	0.5	±	±	0	0	4	3	1	0	0	0	0	—	0	0	0	—	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0
Murine (Wilmington) guinea pig pool	20	16	4	4	4	4	4	4	4	4	4	4	4	—	4	4	4	—	4	3	0	0	4	1	0	0	—	4	4	0	4	4	4	0
	40	8	4	4	4	4	4	4	4	2	4	4	3	—	4	4	4	—	4	1	0	0	4	±	0	0	—	4	4	0	4	4	4	0
	80	4	4	4	4	2	4	4	4	±	4	4	2	—	4	4	4	—	4	±	0	0	3	0	0	0	—	4	3	0	4	4	3	0
	160	2	4	4	4	0	4	4	2	0	4	3	0	—	4	4	3	—	±	0	0	0	±	0	0	0	—	4	1	0	4	3	±	0
	320	1	4	4	±	0	4	2	±	0	±	0	0	—	4	4	1	—	0	0	0	0	0	0	0	0	—	0	0	0	4	±	0	0
	640	0.5	±	0	0	0	4	±	0	0	0	0	0	—	±	0	0	—	0	0	0	0	0	0	0	0	—	0	0	0	±	0	0	0

gens tested was anticomplementary in a dilution of 1:5. After preliminary determination of titers of antisera and antigens, cross-titration of epidemic and murine antisera were carried out with various concentrations of each antigen (table 1). For the sake of clarity, cross-reactions with epidemic and murine antisera in the presence of 2 units of antigen are tabulated separately (table 2).

TABLE 2.—*Abstract: Complement fixation cross-titration of guinea pig epidemic and murine antiserum against 2 units of epidemic and murine soluble and specific antigens*

Antigen 2 units	Guinea pig immune serum [1] (Breinl)						Guinea pig immune serum [1] (Wilmington)					
	20	40	80	160	320	640	20	40	80	160	320	640
Breinl soluble	4	4	4	4	4	±	4	4	4	4	4	0
Ishii soluble	4	4	4	4	4	3	4	4	4	4	2	±
Uchida soluble	4	4	4	4	3	0	4	4	4	3	0	0
Wilmington soluble	4	4	1	0	0	0	4	4	4	4	4	±
Breinl specific, AMS	4	4	4	4	0	0	3	1	±	0	0	0
Epidemic specific, P. D	4	4	4	4	0	0	1	±	0	0	0	0
Wilmington specific, AMS	0	0	0	0	0	0	4	4	4	4	0	0
Wilmington specific, P.D	0	0	0	0	0	0	4	4	4	3	±	0

[1] Titer of both epidemic and murine guinea pig serum pools 1:320 with 2 units of homologous soluble antigen. (Titer of 1:80 represents 4 units of antiserum).

Secondary complement titration at 4°–8° C. Complement containing 2 full units in 0.5 cc.

0.1 cc.	0.15 cc.	0.2 cc.	0.25 cc.	0.3 cc.	0.4 cc.	0.5 cc.
4	2	±	0	0	0	0

With the soluble antigens tested, those prepared from epidemic strains showed a greater degree of cross-reaction than did the murine antigen. With Ishii soluble antigen, positive complement fixation was obtained in higher dilutions of Breinl antiserum than with the homologous antigen. Similarly, when 4 units of Ishii antigen were employed, Wilmington antiserum reacted to a higher titer than when homologous antigen was used.

SCREENING TESTS

In order to determine the suitability of soluble antigens for preliminary screening of sera, complement-fixation tests were set up on a total of 475 sera from presumably normal individuals in Korea, Hokkaido, Kyushu and Okinawa collected in connection with another program. Approximately 39 percent of these sera were tested with Wilmington soluble antigen; 43 percent with Ishii soluble antigen and 18 percent with Uchida soluble antigen. Forty-seven sera were found to be anticomplementary. Of the 428 specimens remaining, 169 gave positive complement-fixation reactions with soluble antigen in dilutions ranging from 1:10 to 1:80. Seventy-two of the 169 sera positive with soluble antigen were also positive with epidemic or murine specific rickettsial antigen or with both; 97 were negative with specific antigens.

Regardless of which soluble antigen was employed, in no instance was a positive reaction obtained with specific antigen where the reaction with soluble antigen was negative. With the exception of six sera, antibody reacting with soluble antigen was present in at least equal, and usually higher, titer where epidemic or murine specific complement-fixing antibody was present. In each of the six exceptions, specific antigen reactions were positive for epidemic typhus and reaction with Wilmington soluble antigen was positive in one dilution lower than the Breinl rickettsial antigen titer.

Sufficient serum remained in 71 of the 97 specimens which showed positive reactions with soluble antigen but negative fixation with specific antigens to permit of testing by the Kolmer complement-fixation technic. Of these, only 3 specimens were positive, 1 was doubtful, 5 had become anticomplementary, and the remaining 61 were Kolmer negative. Thus, only a small proportion of these reactions could be attributed to false positives due to syphilitic infections.

DISCUSSION

The fact that antibody common to both epidemic and murine typhus rickettsiae has been found to occur invariably in serum from human typhus cases or from guinea pigs recovered from experimental infections with either type of disease, where specific antibodies can be demonstrated, and the fact that such antibody reacts with the soluble antigen liberated by ether treatment of yolk sac preparations of either epidemic or murine strains, makes possible the employment of soluble antigen for preliminary screening of sera in typhus complement-fixation tests. Since soluble antigen is ordinarily obtained as a byproduct in the preparation of specific typhus rickettsial antigens from yolk sac cultures by the ether extraction method, the preparation of this material entails no added cost or effort. Soluble antigen can be derived also from commercial typhus vaccine stocks and, if desired, concentrated by precipitation with sodium sulfate according to the method of van der Scheer, Bohnel and Cox (*13*). These authors found also that treatment of typhus vaccines with benzene followed by sodium sulfate precipitation caused a marked decrease in reaction of the purified and concentrated soluble antigen with human syphilitic sera using complement fixation at icebox temperature.

The considerable expense and technical skill required for manufacture of specific antigens in quantities adequate for large-scale typhus diagnostic or survey work adds to the desirability of elimination of a majority of negative or anticomplementary specimens by screening with soluble antigen. If an antigen of a type showing strong cross-reactions is employed, results at this laboratory indicate that no typhus positive sera either of epidemic or murine type will be missed, and that an estimation of maximum expected titer with specific rickettsial antigen may be obtained. Consequently, a considerable reduction results in quantities of highly purified rickettsial antigens later required in quantitative complement-fixation tests.

Further work is necessary to determine to what extent positive complement-fixation reactions in human sera with soluble antigens but not with specific antigens is indicative of actual typhus infection. Positive antibody titers with soluble antigen have been found in guinea pigs experimentally infected with murine typhus at stages of the disease before specific murine antibody could be detected by the complement-fixation technic. In human cases diagnosed as murine typhus on the basis of clinical and epidemiological grounds, Weil-Felix and rickettsial agglutination titers, complement-fixing antibody for soluble antigen has been found to occur in significant titer in the absence of specific complement-fixing antibody. It may well be that soluble (common) antibody appears earlier and persists at a measurable titer for a longer period than antibodies of the specific rickettsial type. False positive reactions with soluble antigen may also result in diseases other than syphilis and may account for a further proportion of these apparently anomalous results.

SUMMARY

Soluble antigen prepared by ether treatment of typhus infected yolk sac suspensions may be employed for preliminary screening of sera in typhus complement-fixation studies. Considerable saving in specific rickettsial antigen may be expected by partial elimination of sera lacking in specific complement-fixing antibodies or showing anticomplementary properties, and in the approximate determination of maximum expected titers in quantitative tests.

REFERENCES

(1) Craigie, J.: Application and control of ethyl-ether-water interface effects to the separation of rickettsiae from yolk sac suspensions. Canad. J. Research E23: 104 (1945).

(2) Topping, N. H., and Shear, M. J.: Studies of typhus fever vaccines. Sec. III Studies of antigens in infected yolk sacs. Nat. Inst. of Health Bull. No. 183. Studies of typhus fever 13 (1945).

(3) Plotz, H.: Complement-fixation in rickettsial diseases. Science 97: 20 (1943).

(4) Topping, N. H., and Shepard, C. C.: The preparation of antigens from yolk sacs infected with rickettsiae. Pub. Health Rep. 61: 701 (1946).

(*5*) Shepard, C. C., and Topping, N. H.: Preparation of suspensions rickettsiae from infected yolk sacs without the use of ether. J. Immunol. **55:** 97 (1947).
(*6*) Fulton, F., and Begg, A. M.: Chemotherapeutic and other studies of typhus. V. The antigenic structure of typhus rickettsiae. Medical Research Council. Special Rept. Series No. 255, 163–191. London, HM Stationery Office (1946).
(*7*) Shepard. C. C., and Wyckoff, R. W. G.: The nature of the soluble antigen from typhus rickettsiae. Pub. Health Rep. **61:** 761 (1946).
(*8*) Craigie, J., Watson, D. W., Clark, E. M., and Malcomson, M. E.: The serological relationships of the rickettsiae of epidemic and murine typhus. Canad. J. Research E **24:** 84 (1946).
(*9*) Wishart, F. O., and Malcomson, M. E.: Studies of the serology of typhus fever. I. Complement-fixing antigens of Rickettsiae prowazeki and their relationship to Proteus OX19. Canad. Pub. Health J. **37:** 369 (1946).
(*10*) Reynolds, F. H. K., and Pollard, M.: The employment of rickettsial vaccine for antigen in the diagnostic complement-fixation test. Am. J. Trop. Med. **23:** 321, 433 (1943).
(*11*) Damon, S. R., and Johnson, M. B.: The serologic diagnosis of endemic typhus. I. The use of specially prepared rickettsial suspensions and commercial typhus vaccines as antigens in the complement-fixation test. J. Lab. and Clin. Med. **30:** 233 (1945).
(*12*) Wertman, K.: Nonspecific complement-fixing antigen in embryonic egg tissues. J. Lab. and Clin. Med. **30:** 112 (1945).
(*13*) van der Scheer, J., Bohnel, E., and Cox, H. R.: Diagnostic antigens for epidemic typhus, murine typhus and Rocky Mountain spotted fever. J. Immunol. **56:** 365 (1947).

STATISTICAL STUDIES OF HEART DISEASES

I. Heart Diseases and Allied Causes of Death in Relation to Age Changes in the Population[1]

By I. M. MORIYAMA, *Principal Biostatistician*, and MARY GOVER, *Biostatistician, Public Health Service*

The annual number of deaths from diseases of the heart, 424,328 in 1945, is not only a staggering figure but is considerably more than twice the mortality from the second most frequent cause of death, cancer, with 177,464 deaths in 1945. Mortality statistics alone do not tell the complete story of the enormous cost to society of diseases of the heart, but they do provide the most reliable index of the course of heart disease in the past, and from them an estimate can be obtained of the size of the problem that confronts doctors and health authorities of the future as well as the present.

Heart disease has not always occupied its present preeminent position as a cause of death. In 1900 it was fourth in the rank order of the leading causes of death in the United States death registration States. About the year 1910 it became for the first time the most frequent cause of death, and since that time heart disease has been, except for the period of the 1918 influenza pandemic, the unchallenged leader of the list.

---

[1] This is the first of a series of papers dealing with the statistics of heart disease morbidity and mortality. The papers are the result of a U. S. Public Health Service study carried on jointly by the National Office of Vital Statistics and the Division of Public Health Methods with the cooperation of the Division of States Relations.

TABLE 1.—*Mortality from selected causes of death in successive decades: Death registration States, 1900–1945* [1]

Cause of death	Death rates (per 100,000 population)						Proportionate mortality (percentage of deaths, all causes)					
	1900	1910	1920	1930	1940	1945	1900	1910	1920	1930	1940	1945
All causes	1,719.1	1,468.0	1,298.9	1,132.1	1,074.1	1,062.1	100.0	100.0	100.0	100.0	100.0	100.0
Communicable diseases:												
Tuberculosis (all forms)	194.4	153.8	113.1	71.1	45.8	40.1	11.3	10.5	8.7	6.3	4.3	3.8
Pneumonia (all forms) and influenza	202.2	155.9	207.3	102.5	70.1	51.8	11.8	10.6	16.0	9.1	6.5	4.9
Diarrhea and enteritis	142.7	115.4	53.7	26.0	10.3	8.7	8.3	7.9	4.1	2.3	1.0	.8
Diphtheria	40.3	21.1	15.3	4.9	1.1	1.2	2.3	1.4	1.2	.4	.1	.1
Typhoid fever	31.3	22.5	7.6	4.8	1.1	.4	1.8	1.5	.6	.4	.1	.04
Chronic diseases of older ages:												
Diseases of the heart (all forms)	137.4	158.9	159.6	214.2	291.9	321.5	8.0	10.8	12.3	18.9	27.2	30.3
Intracranial lesions of vascular origin	106.9	95.8	93.0	89.0	90.8	97.9	6.2	6.5	7.2	7.9	8.5	9.2
Nephritis (all forms)	88.6	94.8	88.8	91.0	81.4	66.7	5.2	6.5	6.8	8.0	7.6	6.3
Cancer	64.0	76.2	83.4	97.4	120.0	134.5	3.7	5.2	6.4	8.6	11.2	12.7
Diabetes mellitus	11.0	15.3	16.1	19.1	26.5	26.6	.6	1.0	1.2	1.7	2.5	2.5

[1] Data from "Vital Statistics Rates in the United States, 1900–1940" (*2*).

Some impression of the increasing significance of heart disease as a cause of death during the period 1900 to 1945 may be gained from the crude death rates for 10 principal causes of death in the United States death registration States. Table 1 shows the mortality from heart disease in relation to other leading causes at the beginning of each decade and also the proportion of all deaths attributed to each specified cause.

In the first 10 years of the United States death registration system, the public health movement was at a stage in which the health officer was still chiefly preoccupied with the problems of sanitation and quarantine of infectious disease cases. As time went on, the success of the efforts of the health officer in preventing the communicable diseases and of the physician in saving the lives of those taken ill began to become apparent in the reduction of mortality from the communicable diseases. During the past 45 years, diseases which were once serious national health problems have been virtually eliminated as causes of death. This is largely the result of sanitary control of environment, isolation of contagious disease cases, artifical immunization, and the development and application of new therapeutic medical and surgical techniques. Among these diseases are typhoid fever, whooping cough, diphtheria, scarlet fever, and diarrhea and enteritis. Great strides have also been taken in the field of infant welfare. Improved sanitation and nutrition have done much to reduce the infant mortality rate from 100 per 1,000 live births in 1915 to 38 per 1,000 live births in 1945. Even tuberculosis and pneumonia, the two most important causes of death at the turn of the century, are yielding to medical and public health advances. Although there is still a long way to go in the conquest of these diseases, the death rate for tuberculosis in 1945 was only 21 percent of the rate in 1900, and the pneumonia death rate, particularly in recent years, indicates substantial gains in pneumonia control as a result of sera, antibiotics, and chemotherapy. The average pneumonia death rate of 49 per 100,000 population in the 5-year period 1941–45 is in marked contrast to the average rate of 161 per 100,000 population in the years 1900–1904.

Beginning in the second decade of the century a new emphasis was placed upon the broader aspects of health. The programs of nonofficial health agencies began to get under way. There was also a rapid development in the field of public health nursing. Closer integration of medicine into the public health program was sought, and this resulted in the establishment of prenatal clinics and special clinics for tuberculosis, syphilis, cancer, heart disease, and mental hygiene. Such activities tell a story of changing objectives in public health. The death rates for 10 leading causes in table 1 illustrate only one small phase of this story of medical and public-health achievements and shifting objectives, but the figures do show how the most important infectious diseases have given way to the chronic and degenerative diseases as the chief causes of mortality.

During this period of extraordinary advances in public health, the death rate for heart disease climbed steadily. It was one of the few causes that exhibited such a trend; cancer and diabetes were like heart disease in this respect. In the 45 years since 1900, the death rate for heart disease increased from 137 to 322 per 100,000 population while the death rate for all causes dropped from 1,719 to 1,062 per 100,000 population in the United States death registration States.

These trends of mortality from heart disease and other causes of death have been described here in terms of crude annual death rates. Such rates show the proportion of the population lost each year as a result of deaths attributed to the particular cause or causes. As such they are a valid measure of the total impact of these diseases. However, it is well known that a changing age distribution within the population can alter the crude death rates without any accompanying alteration of the rates of dying at specific ages. In fact, the part played by the aging of the population of the United States in the upward trend of the heart disease death rate has already been described many times. Nevertheless, before proceeding to a more detailed analysis of the trend, it is worthwhile to review briefly the reasons for the aging and the evidence that shows it is actually taking place.

PERCENTAGE OF POPULATION IN SPECIFIED AGE GROUPS, 1880-2000[11]

PERCENTAGE OF DEATHS IN SPECIFIED AGE GROUPS, 1880-1940[12]

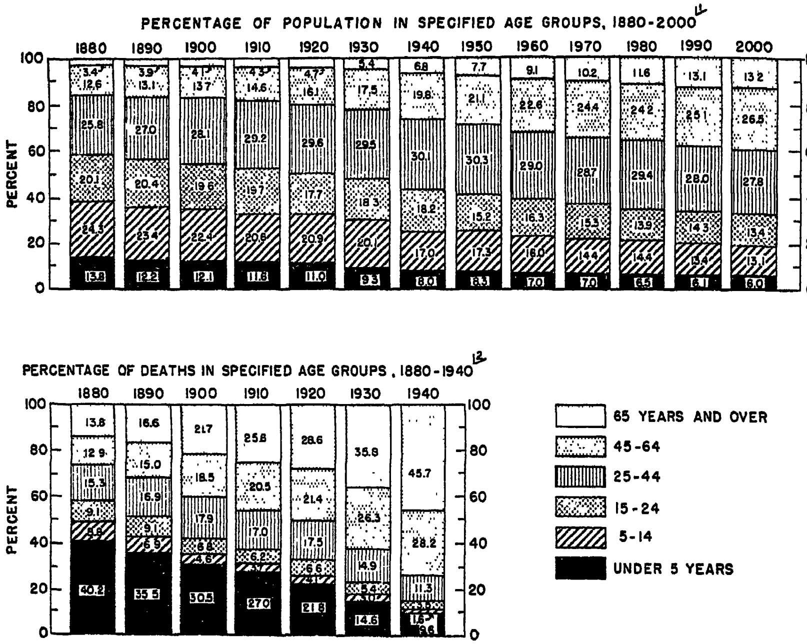


FIGURE 1.

[1] Percentage of the population in specified age groups according to decennial enumerations, 1880–1940; and estimated percentage age distribution of the population, 1950–2000 (*8*).

[2] Percentage of deaths from all causes in specified age groups for the expanding death registration area, 1900–1940. Deaths for 1880 and 1890 were recorded when the population was enumerated.

It is significant that the major decreases in mortality since 1900 have occurred in the childhood and early adult ages of life. The natural consequence of improving the chances of survival through the younger ages has been an increase in the proportion of the population alive at the older ages. This tendency has been reinforced by the decline in the birth rate (up until about 10 years ago) and the curtailment of immigration. During the period 1900–1940, the median age of the population of the United States increased from 22.9 to 29.0 years. Even more striking was the increase in the proportion of persons in the population 45 years of age and over, which rose from 18 percent in 1900 to 27 percent in 1940. At the same time the proportion under 15 years of age decreased from 35 to 25 percent while the population at ages 15–44 years remained practically stationary at approximately 48 percent. Figure 1 shows the percentage of the population in specific age groups as enumerated in the various censuses from 1880 to 1940 and as estimated to the year 2000. The estimates of the future population, published by the Bureau of the Census (*8*), are a revision of estimates prepared by the Scripps Foundation for Research in Population Problems and published by the National Resources Planning Board in 1943 (*6*, *7*). The prediction for the year 2000, under certain reasonable assumptions, is that 40 percent of the population will be 45 years of age or over and only 19 percent will be under 15 years.

The age distribution of total deaths has changed in a pronounced manner, reflecting, in part, the change that has been taking place in the age distribution of the living population (fig. 1). In 1880, 40 percent of the recorded deaths occurred under 5 years of age while 14 percent were 65 years of age and over (*9*); in 1940 only 10 percent of deaths were under 5 years of age while 46 percent were 65 years of age or older. In other words, practically half the deaths occurring at the present time are among persons in the definitely older age brackets.

The effect of these changes in the age composition of the population upon the death rates can be eliminated by computing age-adjusted death rates. The so-called "direct method" has been used here. In this method the rates of mortality at specific ages are applied to the numbers of persons alive at corresponding ages in a selected population usually spoken of as the "standard population." In this case the populations by age of the United States in 1940 were used. The same standard population is used for all sets of age-specific rates that are to be compared. Thus, there is found the number of deaths that would be expected in the standard population if any given set of age-specific mortality rates were prevailing. These expected deaths divided by the total standard population give the age-adjusted death rate. The same proportionate distribution of population having been used for each set of age-specific rates, the age-adjusted rates are free from the effect of any changes in the age distribution of the population; the method may be used for comparing rates for one area with another as well as for comparisons over a period of time.

The age changes affect the crude rates for specific causes of death to varying extents. Hence, when age-adjusted rates are computed for each cause, the increasing importance of heart disease in relation to other leading causes can be more meaningfully assessed. Figure 2 shows in rank order the age-adjusted rates for 25 major causes of death in the death registration States of 1900 in the years 1900, 1920, and 1940. Although the changes in relative importance of the various causes, as shown in figure 2, are independent of the increasing proportions of older persons in the population, they are not free from the presumably increasing ability of physicians to make better diagnoses. The causes shown in the chart were selected because they were important causes of death at some time during the period (1900–1940) and are the same for each of the three census years. In general,

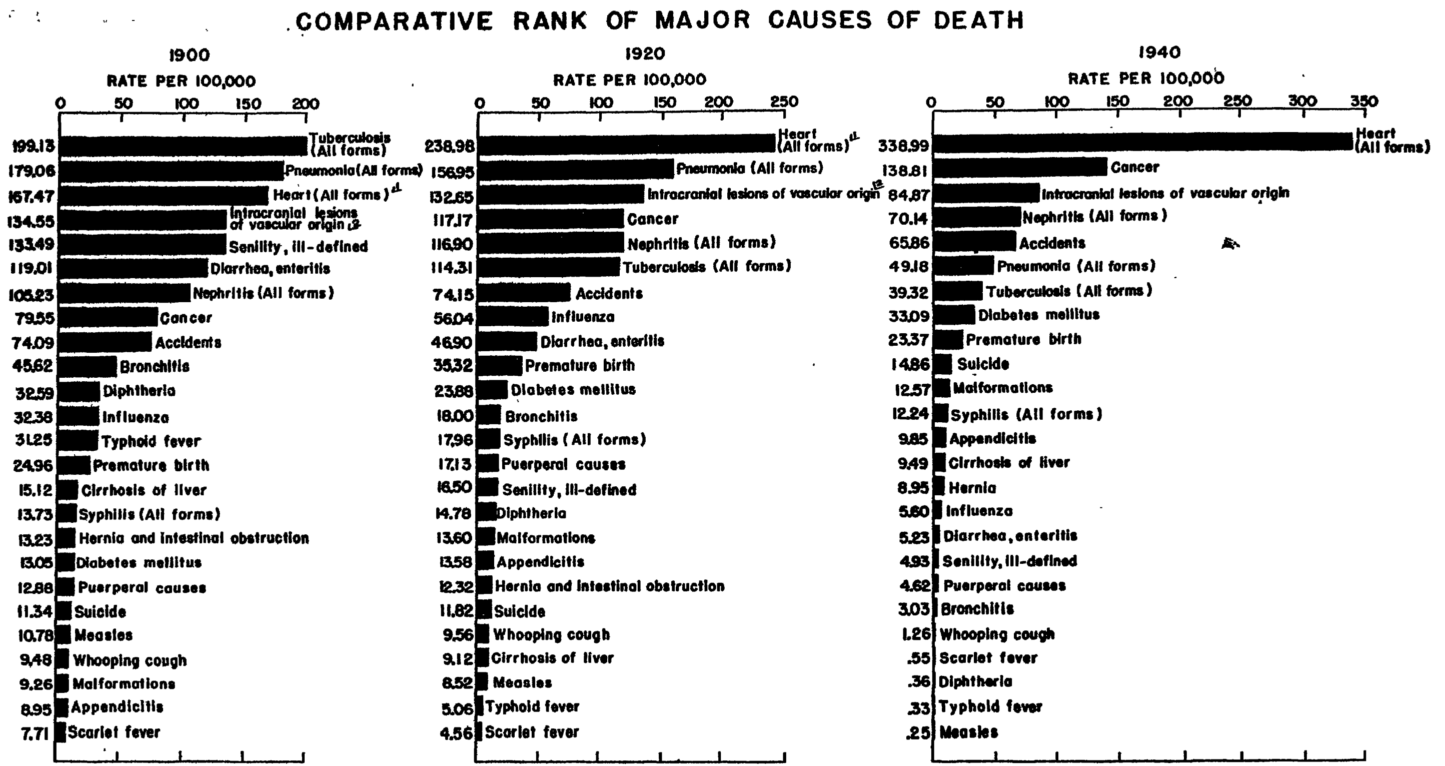


FIGURE 2.—Comparative rank of age-adjusted rates for major causes of death, in the death registration States of 1900, for 1900, 1920, and 1940. Rates are adjusted to the age distribution of the total population, enumerated, 1940.

[1] Excludes diseases of coronary arteries.

[2] Includes all embolism and thrombosis, except puerperal.

it can be seen that the tendency, already described, for the chronic and degenerative diseases of middle and old age to replace the infectious diseases as leading causes of death is not essentially altered when the changing age distribution of the population is taken into account. In particular, the chart shows that "diseases of the heart" has progressed in the 40-year interval from third to first place, nephritis from seventh to fourth, cancer from eighth to second, and diabetes from eighteenth to eighth place, while tuberculosis, pneumonia, diarrhea and enteritis, diphtheria and other communicable diseases have declined from higher to lower ranks.

The course of mortality from 15 of the important causes of death for the period 1900–1945 is shown in greater detail in figure 3. The death rates shown for measles, whooping cough, scarlet fever, and diphtheria are for the age group under 20 years; mortality under 1 year of age from diarrhea and enteritis is expressed in terms of deaths per 1,000 live births; the remainder of the rates are age-adjusted in the manner described above (*3*). The marked drop in mortality from the chief infectious diseases is obvious. Lesser declines in the rates for intracranial lesions of vascular origin and nephritis, and increases for heart disease, cancer, and diabetes are also apparent.

Since the upward trend is evident even in age-adjusted rates for some of the diseases characteristic of middle and old age, the aging of the population could not be wholly responsible. This aging, however, does make it logical to suppose that a further upward movement of the crude death rate for heart disease, at least, is almost inevitable. For it is apparent that the effect of the survival of greater numbers of persons to advanced ages is simply to increase the relative numbers exposed to the chance of death at these ages, and this, in turn, will result in a steady tendency toward higher crude death rates for such diseases as are especially inclined to cause death among the older groups. Thus far, however, the decline in the mortality rates for infectious diseases (including tuberculosis and pneumonia) has been so rapid that, despite the increase in mortality for the "old age" diseases taken as a group (including heart disease, intracranial lesions of vascular origin, nephritis, cancer, and diabetes), there has been a downward trend in the crude death rate for all causes combined. With further public health advances, particularly in the south and southwest, the general mortality rate may continue to decrease somewhat, but it is not expected that the crude or general death rate for the United States will ever fall much below the present level of about 10 per 1,000 population. Indeed, if the age structure of the population continues to change in the manner illustrated in figure 1, a moderate upward trend in the crude death rate is indicated for the future. It

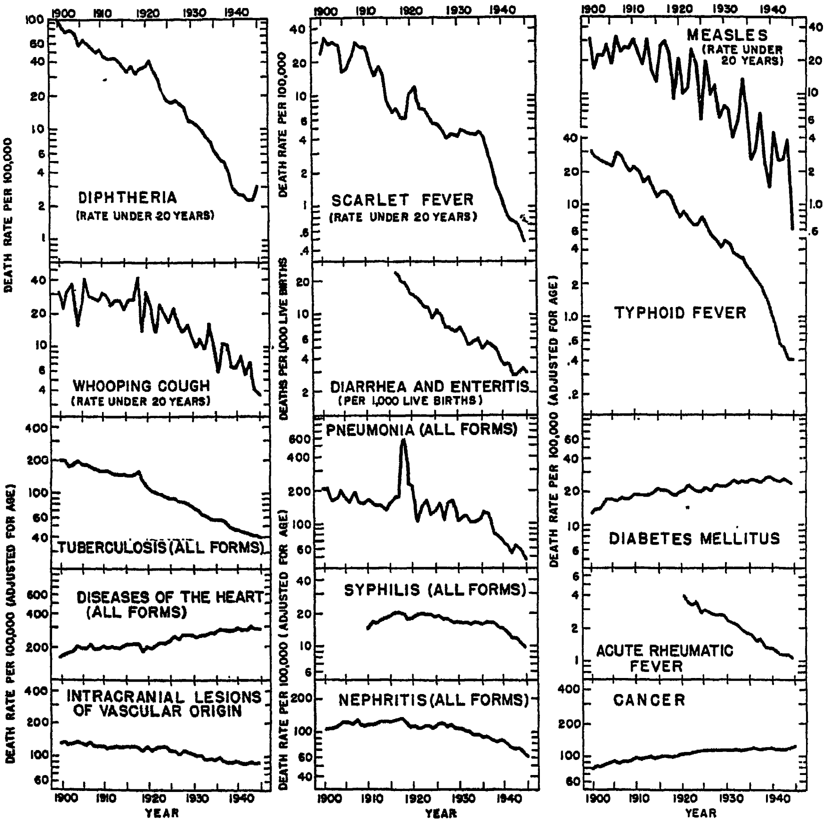


Figure 3.—Course of mortality for selected causes of death in the expanding death registration States (logarithmic scale), 1900–1945.

has been variously estimated by Dublin and Lotka (*1*), by Thompson and Whelpton (*5*), and by Perrott and Holland (*4*), that the crude death rate in 1980 will be 13.0, 14.5, and 17.0 per 1,000 population, respectively. The last of these estimates, unlike the other two, takes no account of expected further reductions in the age-specific mortality rates for all causes combined, and the authors state that they think it is unlikely that the actual death rate will reach their estimated figure. Their computation was made solely to show how the expected aging of the population between 1935 and 1980 could alone be responsible for an increase in the death rate from 11 per 1,000 in 1935 to about 17 per 1,000 in 1980, the age-specific rates remaining fixed during that interval.

Although there is some variation in the predicted crude death rate because of differences in the assumptions made, there is no question that heart disease will continue to play the principal role in the upward trend of mortality unless some revolutionary advance is made in medical knowledge bearing upon the prevention or treatment of cardiac diseases. If the age-specific mortality rates for heart disease in 1945 are applied to the estimated populations at specific ages in 1980, it is found that they would cause 74 percent more deaths in 1980 than they did in 1945. On a rate basis this increase would amount to 40 percent, or a rate of about 452 per 100,000 population in 1980, in contrast to the 1945 rate of 321. It may also be estimated on the basis of a crude general death rate of about 14 per 1,000 population in 1980 that deaths from heart disease will constitute roughly 32 percent of all deaths occurring in that year. If the age-specific death rates for heart disease at ages over 45 continue to increase, even at a reduced rate, the proportion will be considerably higher.[2]

These computations may give some idea of what the magnitude of the health problems relating to heart disease promises to become in the future. Even today they offer a major challenge to society. The cardiovascular-renal diseases are not as amenable to control as are most of the infectious diseases. However, trends of mortality from syphilis and acute rheumatic fever, and other infections which may lead to specific heart conditions, are definitely downward, and, with respect to the larger group of degenerative heart diseases, much can be done at present to postpone the onset of cases and to slow their progress.

A thorough investigation of various statistical aspects of heart disease, based upon morbidity data from surveys and mortality data from the death registration system, is now in progress. This investigation will take the form of a series of studies each of which will present and analyze material on a particular phase of the cardiac disease problem in the United States.

REFERENCES

(*1*) Dublin, Louis I., and Lotka, Alfred J.: Length of life. New York, The Ronald Press Co., 1936, p. 265.

(*2*) Linder, Forrest E., and Grove, Robert D.: Vital statistics rates in the United States, 1900–1940. United States Bureau of the Census, 1943.

(*3*) Moriyama, I. M.: Age-adjusted death rates in the United States, 1900–1940; vital statistics—special reports, Vol. 23, No. 1, United States Bureau of the Census, 1945.

(*4*) Perrott, G. St. J., and Holland, Dorothy F.: Population trends and problems of public health. Milbank Memorial Fund Quarterly, 18: 359 (1940).

(*5*) Thompson, Warren S., and Whelpton, P. K.: Population trends in the United States. New York, McGraw-Hill Co., 1933, p. 238.

(*6*) Whelpton, P. K.: An empirical method of calculating future population. J. Am. Statis. A. 31 (195): 457 (1936).

(*7*) National Resources Committee: Population statistics, 1, national data, Government Printing Office, 1937.

(*8*) United States Bureau of the Census: Forecasts of the population of the United States by age and sex: 1945 to 2000; population—special reports, Series P–46, No. 7, September 15, 1946.

(*9*) United States Department of the Interior, Census Office: Report on the mortality and vital statistics of the United States, as returned at the Tenth Census (June 1, 1880), 1885.

---

[2] It is worth noting that a significant decline in mortality from any important cause of death other than heart disease, such as cancer, for example, could also result in the attributing of more deaths to diseases of the heart and, hence, a higher crude death rate for that cause.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED APRIL 3, 1948

Summary

The incidence of influenza declined from a total of 4,642 cases last week to 3,658 for the current week. For the corresponding week last year the total was 48,968, and the 5-year (1943–47) median is 2,770. Of the 7 States reporting currently more than 67 cases, 4 showed decreases, while 3 (Virginia, South Carolina, and Oklahoma) showed a combined increase of 201 cases. The total for the year to date is 121,308. The peak of reported incidence, 14,253 cases, was reached in the week ended January 31. Last year a rise beginning unusually late (the latter part of February) and increasing sharply brought the total for the corresponding period to 206,662 cases. The highest weekly incidence of that year, 52,115 cases, was reported for the week ended March 22.

Of the current total of 18 cases of poliomyelitis (last week 33, 5-year median 24), the lowest weekly incidence since May 1944, only Texas (5 cases), and New York and Indiana (2 cases each) reported more than 1 case. The total for the year to date is 399, as compared with 667 for the same period last year and a 5-year median of 453.

The total reported incidence to date of the dysenteries (amebic, bacillary, and undefined) is 6,700 cases, or 53 percent above the combined 5-year median (4,371). Of the other diseases listed in the following tables, cumulative figures to date for only infectious encephalitis, Rocky Mountain spotted fever, and undulant fever are above the corresponding median expectancies.

A total of 9,685 deaths was recorded during the week in 92 large cities of the United States, as compared with 9,634 last week, 10,169 and 9,021, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 9,097. The total for the year to date (14 weeks) is 142,350, as compared with 141,212 for the same period last year. Infant mortality for the week in the same cities totaled 696, as compared with 679 last week and a 3-year median of 605. The cumulative figure is 9,708, as compared with 11,307 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended Apr. 3, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria: Week ended— Apr. 3, 1948	Diphtheria: Week ended— Mar. 29, 1947	Diphtheria: Median 1943–47	Influenza: Week ended— Apr. 3, 1948	Influenza: Week ended— Mar. 29, 1947	Influenza: Median 1943–47	Measles: Week ended— Apr. 3, 1948	Measles: Week ended— Mar. 29, 1947	Measles: Median 1943–47	Meningitis, meningococcus: Week ended— Apr. 3, 1948	Meningitis, meningococcus: Week ended— Mar. 29, 1947	Meningitis, meningococcus: Median 1943–47
NEW ENGLAND												
Maine	0	1	0	3	------	------	27	195	27	0	0	0
New Hampshire	0	0	0	------	1	1	3	5	5	1	0	0
Vermont	0	0	0	------	107	------	2	275	171	1	0	0
Massachusetts	4	10	4	------	------	------	1,094	404	1,149	0	0	9
Rhode Island	0	0	1	------	------	1	4	165	11	0	0	3
Connecticut	0	2	2	8	------	3	71	573	455	2	0	5
MIDDLE ATLANTIC												
New York	9	20	17	[1] 7	[1] 9	[1] 6	2,359	383	2,799	8	4	24
New Jersey	4	1	3	9	23	9	1,150	390	1,653	1	1	5
Pennsylvania	8	22	14	(2)	(2)	[2] 2	1,488	291	1,424	5	9	11
EAST NORTH CENTRAL												
Ohio	8	13	13	------	141	9	1,127	647	647	2	7	12
Indiana	7	10	6	------	259	15	634	90	294	0	1	2
Illinois	4	6	15	2	189	14	2,247	77	1,271	4	10	17
Michigan [3]	3	7	7	2	78	4	1,332	41	1,295	3	4	7
Wisconsin	2	8	1	12	1,853	46	1,754	289	1,563	2	1	2
WEST NORTH CENTRAL												
Minnesota	5	2	3	------	13	------	426	73	73	1	1	4
Iowa	0	0	2	1	6,036	------	513	107	118	2	1	2
Missouri	3	1	4	2	230	3	476	4	369	2	3	6
North Dakota	0	0	0	4	20	8	18	16	16	0	0	0
South Dakota	0	0	3	------	------	------	43	13	19	0	0	0
Nebraska	0	2	2	30	9	9	292	4	125	0	0	0
Kansas	1	5	3	4	926	3	59	11	629	1	3	3
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	71	2	22	0	0	1
Maryland [3]	10	6	11	3	20	8	107	23	140	2	1	5
District of Columbia	0	0	0	------	4	1	122	31	75	0	0	1
Virginia	5	9	4	398	3,986	259	202	437	621	3	2	5
West Virginia	4	3	2	41	2,474	7	346	95	95	6	1	4
North Carolina	5	7	7	------	------	------	7	265	265	2	3	3
South Carolina	5	7	5	482	2,305	473	126	127	175	0	1	2
Georgia	3	3	4	7	805	35	51	87	264	2	1	2
Florida	5	5	3	2	135	5	296	21	69	1	0	2
EAST SOUTH CENTRAL												
Kentucky	3	10	5	------	------	7	142	4	105	3	4	5
Tennessee	3	4	4	35	1,125	57	301	80	297	5	3	7
Alabama	1	12	7	112	1,085	93	63	145	164	2	4	6
Mississippi [3]	2	6	5	18	255	------	59	19	------	3	1	3
WEST SOUTH CENTRAL												
Arkansas	1	5	4	183	4,576	87	133	117	157	1	0	2
Louisiana	0	1	3	2	315	55	28	119	121	1	1	5
Oklahoma	6	3	3	133	6,891	131	38	8	95	3	2	2
Texas	33	28	29	1,750	12,332	1,143	2,053	289	1,297	1	2	16
MOUNTAIN												
Montana	0	1	1	66	851	21	39	137	137	4	1	1
Idaho	0	1	1	35	242	1	49	4	27	0	0	0
Wyoming	0	0	1	------	53	12	176	15	27	0	0	0
Colorado	8	4	7	67	393	35	792	40	354	1	0	2
New Mexico	4	3	0	4	22	4	22	88	21	0	0	1
Arizona	1	3	2	111	119	98	184	------	31	0	1	0
Utah [3]	0	0	0	3	309	15	44	15	156	0	0	0
Nevada	0	0	0	------	------	------	10	------	------	0	0	0
PACIFIC												
Washington	3	10	7	8	428	2	460	52	261	1	0	2
Oregon	3	1	5	61	220	22	------	31	135	0	2	2
California	16	8	21	53	129	70	2,744	261	1,142	3	3	23
Total	179	250	250	3,658	48,968	2,770	23,784	6,565	26,183	79	78	216
13 weeks	2,725	3,760	3,760	121,308	206,662	175,984	199,206	69,066	210,408	1,119	1,117	3,232
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	9,083	11,326	12,430	164,866	239,637	239,637	234,152	91,953	248,341	1,901	2,089	5,684

[1] New York City only.

[2] Philadelphia only.

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended Apr. 3, 1948, and comparison with corresponding week of 1947 and 5-year median—Continued

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—: Apr. 3, 1948	Week ended—: Mar. 29, 1947	Median 1943–47	Week ended: Apr. 3, 1948	Week ended: Mar. 29, 1947	Median 1943–47	Week ended—: Apr. 3, 1948	Week ended—: Mar. 29, 1947	Median 1943–47	Week ended—: Apr. 3, 1948[5]	Week ended—: Mar. 29, 1947	Median 1943–47
NEW ENGLAND												
Maine	0	0	0	5	25	32	0	0	0	1	0	0
New Hampshire	0	0	0	1	3	10	0	0	0	0	0	0
Vermont	0	0	0	4	8	10	0	0	0	0	0	0
Massachusetts	0	0	0	130	146	431	0	0	0	1	7	0
Rhode Island	0	0	0	16	10	14	0	0	0	0	0	0
Connecticut	0	0	0	43	63	70	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	2	3	3	251	406	749	0	0	0	2	1	3
New Jersey	0	0	0	90	150	167	0	0	0	1	0	1
Pennsylvania	0	0	0	294	256	472	0	0	0	1	4	2
EAST NORTH CENTRAL												
Ohio	0	0	0	342	398	409	0	0	0	1	0	2
Indiana	2	0	0	66	85	122	0	0	0	1	1	1
Illinois	0	0	0	112	132	271	0	0	0	1	0	3
Michigan[3]	1	2	0	113	205	205	0	0	0	1	1	2
Wisconsin	0	0	0	58	57	317	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	0	1	0	42	40	49	0	0	0	0	2	0
Iowa	1	0	0	41	34	60	0	1	1	1	1	0
Missouri	0	0	0	33	42	80	0	0	0	1	3	1
North Dakota	0	1	0	10	24	24	0	0	0	0	2	0
South Dakota	0	0	0	10	8	11	0	0	0	0	0	0
Nebraska	0	2	0	33	16	41	0	0	0	0	0	0
Kansas	0	0	0	20	52	74	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	1	14	11	0	0	0	0	0	0
Maryland[3]	0	0	0	18	37	146	0	0	0	1	2	0
District of Columbia	0	0	0	5	14	25	0	0	0	1	0	0
Virginia	1	0	0	21	41	104	0	0	0	0	1	1
West Virginia	0	0	0	16	19	38	0	0	0	3	3	1
North Carolina	0	0	0	15	36	36	0	0	0	0	0	0
South Carolina	0	0	0	4	19	10	0	0	0	0	1	1
Georgia	0	0	0	19	12	15	0	0	0	1	1	2
Florida	1	0	0	5	10	9	0	0	0	3	1	1
EAST SOUTH CENTRAL												
Kentucky	0	0	1	18	70	68	0	0	0	1	2	1
Tennessee	0	0	0	23	51	45	0	2	0	0	0	1
Alabama	0	2	1	7	26	26	0	0	0	3	2	2
Mississippi[3]	0	1	0	0	9	9	0	0	1	3	0	0
WEST SOUTH CENTRAL												
Arkansas	0	0	1	3	9	10	0	0	0	0	1	1
Louisiana	0	1	0	1	6	13	0	0	0	5	1	2
Oklahoma	0	0	0	5	14	14	0	0	0	2	1	1
Texas	5	2	2	31	36	118	0	9	1	5	4	4
MOUNTAIN												
Montana	1	0	0	14	7	14	0	0	0	0	0	0
Idaho	1	0	0	8	4	8	0	0	0	0	0	0
Wyoming	0	0	0	4	6	10	0	0	0	0	0	0
Colorado	0	0	0	17	50	50	0	0	0	0	0	0
New Mexico	0	0	0	9	21	18	0	0	0	0	0	1
Arizona	0	0	0	3	8	19	0	0	0	0	0	0
Utah[3]	0	0	0	12	19	49	0	0	0	0	0	0
Nevada	0	0	0	2	0	1	0	0	0	0	0	0
PACIFIC												
Washington	1	0	0	85	22	41	0	0	1	0	2	2
Oregon	1	0	0	18	20	29	0	0	0	0	1	0
California	1	9	4	70	152	229	0	0	0	4	4	3
Total	18	24	24	2,148	2,892	4,336	0	12	18	44	49	54
13 weeks	399	667	453	30,853	35,869	51,038	33	61	136	566	570	692
Seasonal low week[4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	51	55	52	53,392	62,555	89,359	54	115	219	93	85	98

---

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately, as follows: Massachusetts 1 (salmonella infection), Georgia 1, California 2.

Telegraphic morbidity reports from State health officers for the week ended Apr. 3, 1948, and comparison with corresponding week of 1947 and 5-year median—Continued

Division and State	Whooping cough			Week ended Apr. 3, 1948							
	Week ended—		Median 1943–47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Apr. 3, 1948	Mar. 29, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	35	10	12	-	-	-	-	-	-	-	-
New Hampshire	-	5	5	-	-	-	-	-	-	-	-
Vermont	16	11	37	-	-	-	-	-	-	-	2
Massachusetts	51	130	150	-	1	-	-	-	-	-	-
Rhode Island	2	4	15	-	-	-	-	-	-	-	-
Connecticut	19	42	42	1	-	-	1	-	-	-	1
MIDDLE ATLANTIC											
New York	118	160	200	11	3	-	-	-	-	-	1
New Jersey	51	110	110	-	-	-	-	-	-	-	1
Pennsylvania	68	197	122	-	-	-	-	-	-	-	-
EAST NORTH CENTRAL											
Ohio	79	121	121	1	-	-	-	-	-	1	2
Indiana	24	15	15	-	-	3	2	-	1	-	-
Illinois	45	56	57	1	-	-	3	-	1	-	13
Michigan [3]	82	212	121	7	-	-	-	-	-	-	6
Wisconsin	56	107	81	-	-	-	-	-	-	-	14
WEST NORTH CENTRAL											
Minnesota	17	8	16	-	-	-	-	-	-	-	1
Iowa	7	9	9	-	-	1	-	-	-	-	2
Missouri	14	15	8	-	-	2	-	-	-	-	-
North Dakota	4	-	-	8	-	-	-	-	-	-	-
South Dakota	1	-	-	-	-	-	-	-	-	-	-
Nebraska	14	15	8	-	-	-	-	-	-	-	5
Kansas	70	16	37	-	-	-	-	-	-	-	2
SOUTH ATLANTIC											
Delaware	3	3	3	-	-	-	-	-	-	-	-
Maryland [3]	12	46	46	-	-	1	-	-	-	-	2
District of Columbia	1	6	5	-	-	-	-	-	-	-	-
Virginia	51	81	54	-	-	74	-	-	1	-	4
West Virginia	12	-	15	-	-	-	-	-	-	-	-
North Carolina	49	75	98	-	-	-	-	-	-	-	-
South Carolina	111	45	67	1	3	-	1	-	-	2	1
Georgia	14	2	22	1	-	-	-	-	3	2	8
Florida	19	25	22	4	-	2	-	-	-	3	-
EAST SOUTH CENTRAL											
Kentucky	9	51	28	-	-	-	-	-	-	-	1
Tennessee	28	72	18	2	-	1	-	-	-	-	2
Alabama	31	66	31	2	-	-	-	-	-	1	-
Mississippi [3]	-	8	-	-	1	-	-	-	1	2	1
WEST SOUTH CENTRAL											
Arkansas	21	33	17	4	-	-	-	-	3	-	1
Louisiana	10	3	3	3	1	-	-	-	-	-	-
Oklahoma	43	30	13	-	-	-	-	-	-	-	-
Texas	401	568	302	18	229	34	-	-	1	4	12
MOUNTAIN											
Montana	4	8	9	-	-	-	-	-	-	-	-
Idaho	16	-	5	-	-	-	-	-	-	-	2
Wyoming	5	-	2	-	-	-	-	-	-	-	-
Colorado	65	13	22	-	-	-	1	-	-	-	6
New Mexico	12	23	10	-	-	-	-	-	-	-	-
Arizona	35	16	19	-	-	8	-	-	-	-	-
Utah [3]	10	3	32	-	-	-	-	-	-	-	3
Nevada	-	-	-	-	-	-	-	-	-	-	-
PACIFIC											
Washington	33	38	31	2	-	-	-	-	-	-	2
Oregon	26	17	27	7	-	-	-	-	-	-	1
California	87	164	164	5	13	-	-	-	-	-	2
Total	1,881	2,639	2,551	78	251	126	8	0	11	15	98
Same week, 1947	2,639	-	-	81	213	170	11	0	5	18	167
Median, 1943–47	2,551	-	-	40	213	74	9	1	16	33	[6] 95
13 weeks: 1948	28,738	-	-	828	3,273	2,599	119	6	235	187	1,185
1947	33,138	-	-	627	4,267	2,849	92	12	473	561	1,372
Median, 1943–47	31,641	-	-	383	2,602	1,386	106	4	246	609	[6] 1,099

[3] Period ended earlier than Saturday.

[6] 3-year median 1945–47.

Anthrax: Pennsylvania 1.

Alaska: Week ended Mar. 27—Influenza 3, rheumatic fever 4, whooping cough 2, scarlet fever 2; week ended Apr. 3—chickenpox 2, influenza 8, measles 1, meningitis 1, mumps 9, pneumonia 3, scarlet fever 1.

Territory of Hawaii: Week ended Apr. 3—Rabies 0, bacillary dysentery 7, measles 6, whooping cough 13.

WEEKLY REPORTS FROM CITIES *

City reports for week ended Mar. 27, 1948

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	-------	0	0	0	1	0	0	18
New Hampshire:												
Concord	0	0	------	0	-------	0	2	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	-------	0	0	0	0	0	0	------
Massachusetts:												
Boston	1	0	------	0	511	1	5	0	44	0	0	7
Fall River	0	0	------	0	-------	0	0	0	1	0	0	4
Springfield	0	0	------	0	3	0	0	0	2	0	0	1
Worcester	0	0	------	0	1	0	5	0	8	0	0	4
Rhode Island:												
Providence	0	1	1	0	-------	0	1	0	10	0	0	7
Connecticut:												
Bridgeport	0	0	------	0	1	0	0	0	5	0	0	------
Hartford	0	0	1	0	4	0	1	0	2	0	0	3
New Haven	0	0	2	0	1	1	2	0	0	0	0	5
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	20	0	5	0	4	0	0	13
New York	8	3	13	2	1,581	9	82	1	112	0	0	22
Rochester	0	0	------	0	2	0	2	0	10	0	0	1
Syracuse	0	0	------	0	14	0	1	0	5	0	0	5
New Jersey:												
Camden	0	0	------	0	11	0	0	0	3	0	0	1
Newark	0	0	3	0	124	0	3	0	8	0	0	3
Trenton	0	0	------	0	2	1	2	0	3	0	0	2
Pennsylvania:												
Philadelphia	1	0	7	1	421	1	21	0	48	0	0	16
Pittsburgh	1	0	1	1	3	0	13	0	23	0	0	1
Reading	0	0	------	0	10	0	2	0	10	0	0	3
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	42	6	13	0	22	0	0	3
Cleveland	0	0	1	0	17	2	8	0	46	0	1	7
Columbus	0	0	------	0	117	0	6	0	4	0	0	5
Indiana:												
Fort Wayne	0	0	------	0	15	0	2	0	8	0	0	------
Indianapolis	2	0	------	0	117	1	1	0	4	0	0	12
South Bend	0	0	------	0	5	0	0	0	2	0	0	------
Terre Haute	0	0	------	0	9	0	2	0	2	0	0	------
Illinois:												
Chicago	0	0	------	1	1,020	2	32	0	46	0	0	21
Springfield	0	0	------	1	26	0	1	0	0	0	0	------
Michigan:												
Detroit	2	0	------	0	297	0	10	0	75	0	0	15
Flint	0	0	------	0	-------	0	4	0	3	0	0	------
Grand Rapids	0	0	------	0	138	1	0	0	5	0	0	------
Wisconsin:												
Kenosha	0	0	------	0	118	0	0	0	0	0	0	------
Milwaukee	0	0	------	0	41	0	5	0	13	0	0	4
Racine	0	0	------	0	196	0	0	0	1	0	0	2
Superior	1	0	------	0	58	0	0	0	0	0	0	------
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	106	0	1	0	4	0	0	------
Minneapolis	0	0	------	0	30	0	4	0	20	0	0	1
St. Paul	1	0	------	0	34	0	4	0	3	0	0	3
Missouri:												
Kansas City	0	0	2	0	36	0	2	0	2	0	0	12
St. Joseph	0	0	------	0	-------	0	0	0	0	0	0	------
St. Louis	6	0	1	0	290	0	9	0	14	0	0	7

* In some instances the figures include nonresident cases.

City reports for week ended March 27, 1948—Continued

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
South Dakota:												
Fargo	0	0	------	0	1	0	0	0	2	0	0	3
Nebraska:												
Omaha	0	0	------	0	67	0	1	0	1	0	0	1
Kansas:												
Topeka	0	0	------	0	13	0	2	0	0	0	0	------
Wichita	0	0	------	0	2	0	3	0	3	0	0	5
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	33	0	4	0	4	0	0	------
Maryland:												
Baltimore	0	0	3	0	40	1	6	0	7	0	0	14
Cumberland	2	0	------	0	------	0	1	0	0	0	0	2
Frederick	0	0	------	0	------	0	1	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	135	0	8	0	11	0	0	15
Virginia:												
Richmond	0	0	------	0	2	0	3	0	4	0	0	1
Roanoke	0	0	------	0	------	0	0	0	0	0	0	------
West Virginia:												
Charleston	0	0	------	0	2	0	11	0	0	0	0	------
Wheeling	0	0	------	0	12	0	5	0	0	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	0	0	0	1	0	0	------
Wilmington	0	0	------	0	------	0	1	0	0	0	0	7
Winston-Salem	0	0	------	0	------	0	0	0	0	0	0	1
South Carolina:												
Charleston	0	0	21	0	------	0	0	0	0	0	0	2
Georgia:												
Atlanta	0	0	1	1	1	0	2	0	9	0	0	2
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Savannah	0	0	1	1	2	0	1	0	0	0	0	1
Florida:												
Tampa	0	0	2	1	12	0	3	0	1	0	1	3
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	5	134	0	7	0	3	0	0	12
Nashville	0	0	------	0	------	0	2	0	1	0	0	2
Alabama:												
Birmingham	0	0	4	1	------	4	5	0	2	0	0	6
Mobile	0	0	18	3	------	0	1	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	3	1	7	0	0	0	1	0	0	------
Louisiana:												
New Orleans	1	0	3	0	------	4	5	0	1	0	2	8
Shreveport	0	0	------	0	------	0	5	0	0	0	0	------
Oklahoma:												
Oklahoma City	0	0	1	0	11	2	4	0	4	0	0	1
Texas:												
Dallas	0	0	------	0	72	0	2	0	6	0	0	3
Houston	0	0	------	1	19	0	4	0	1	0	0	3
San Antonio	2	0	1	0	16	0	6	0	1	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	------	0	3	0	0	0	0	1
Great Falls	0	0	------	0	5	0	0	0	0	0	0	2
Helena	0	0	------	0	------	0	0	0	0	0	0	------
Missoula	0	0	------	0	1	0	0	0	0	0	0	------
Idaho:												
Boise	0	0	------	0	------	0	2	0	0	0	0	------
Colorado:												
Denver	1	0	------	0	372	0	5	0	3	0	0	11
Pueblo	1	0	------	0	56	0	2	0	4	0	0	10
Utah:												
Salt Lake City	0	0	------	1	21	0	1	0	6	0	0	------

City reports for week ended March 27, 1948—Continued

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	1	0	------	0	18	0	4	0	12	0	0	9
Spokane	0	0	------	0	4	0	2	0	0	0	0	------
Tacoma	0	0	------	0	33	0	0	0	1	0	0	2
California:												
Los Angeles	2	0	4	2	168	3	7	2	27	0	0	7
Sacramento	0	0	------	0	3	0	0	0	4	0	0	------
San Francisco	0	0	4	0	267	3	5	1	12	0	0	6
Total	33	4	98	23	6,950	42	375	5	705	0	4	348
Corresponding week, 1947[1]	89	------	1,118	55	1,513	------	483	------	867	0	10	645
Average 1943-47	68	------	248	[3] 33	[3] 6,714	------	[2] 423	------	1,611	1	10	629

[1] Exclusive of Oklahoma City.
[2] 3-year average, 1945-47.
[3] 5-year median, 1943-47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (latest available estimated population, 34,520,900)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Tyhpoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	2.6	2.6	10.5	0.0	1,362	5.2	41.8	0.0	191	0.0	0.0	128
Middle Atlantic	4.6	1.4	11.1	1.9	1,013	5.1	60.6	0.5	105	0.0	0.0	31
East North Central	3.0	0.0	0.6	1.2	1,348	7.3	51.1	0.0	140	0.0	0.6	42
West North Central	13.9	0.0	6.0	0.0	1,152	0.0	51.7	0.0	97	0.0	0.0	64
South Atlantic	3.3	0.0	46.3	5.0	396	1.7	76.1	0.0	61	0.0	1.7	79
East South Central	0.0	0.0	129.8	53.1	791	23.6	88.5	0.0	35	0.0	0.0	118
West South Central	7.9	0.0	21.0	5.3	329	15.8	68.4	0.0	37	0.0	5.3	39
Mountain	15.9	0.0	0.0	7.9	3,614	0.0	103.3	0.0	103	0.0	0.0	191
Pacific	4.7	0.0	12.7	3.2	780	9.5	28.5	6.3	89	0.0	0.0	38
Total	5.0	0.6	14.8	3.5	1,053	6.4	56.8	0.8	107	0.0	0.6	53

Dysentery, amebic.—Cases: Boston 1, New York 8, Cleveland 1, Flint 1, Memphis 1, New Orleans 1, Los Angeles 6, San Francisco 1.

Dysentery, bacillary.—Cases: New York 2, New Orleans 1.

Dysentery, unspecified.—Cases: Baltimore 2, San Antonio 2.

Typhus fever, endemic.—Cases: New York 1, New Orelans 1.

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended February 28, 1948.—During the 4 weeks ended February 28, 1948, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chickenpox	42	Poliomyelitis	1
Diphtheria	46	Syphilis	124
Dysentery, unspecified	4	Tetanus	5
Gonorrhea	199	Tuberculosis (all forms)	958
Influenza	18	Typhoid fever	9
Malaria	171	Typhus fever (murine)	2
Measles	1,066	Whooping cough	233

DEATHS DURING WEEK ENDED MAR. 27, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Mar. 27, 1948	Corresponding week 1947
Data for 92 large cities of the United States:		
Total deaths	9,634	10,795
Median for 3 prior years	9,436	----------
Total deaths, first 13 weeks of year	132,665	131,043
Deaths under 1 year of age	679	827
Median for 3 prior years	695	----------
Deaths under 1 year of age, first 13 weeks of year	9,012	10,518
Data from industrial insurance companies:		
Policies in force	71,146,501	67,328,480
Number of death claims	13,380	15,305
Death claims per 1,000 policies in force, annual rate	9.8	11.9
Death claims per 1,000 policies, first 13 weeks of year, annual rate	10.3	10.0

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended March 13, 1948.—During the week ended March 13, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		49	1	240	301	61	14	29	118	813
Diphtheria				8	1		2	2		13
Dysentery, bacillary				1					19	20
Encephalitis, infectious						1				1
German measles				27	27	1	1	9	10	75
Influenza		51			18	8			417	494
Measles		1		1,223	1,566	5	4	20	142	2,961
Meningitis, meningococcus				1	2	1				4
Mumps		36	3	359	344	56	49	51	24	922
Poliomyelitis						2				2
Scarlet fever		2	8	54	92	1	2	7	4	170
Tuberculosis (all forms)		7	19	84	41	27	4	52	64	298
Typhoid and paratyphoid fever				10	1				1	12
Undulant fever				1	4			10	2	17
Venereal diseases:										
Gonorrhea	1	13	8	63	70	21	14	43	70	303
Syphilis		12	4	105	40	9	7	13	39	229
Other forms									1	1
Whooping cough				48	26	10	4	52	8	148

JAPAN

Notifiable diseases—4 weeks ended February 28, 1948, and accumulated totals for the year to date.—For the 4 weeks ended February 28, 1948, and for the year to date, certain notifiable diseases were reported in Japan as follows:

Disease	4 weeks ended February 28, 1948		Total reported for the year to date	
	Cases	Deaths	Cases	Deaths
Diphtheria	1,594	182	3,659	418
Dysentery, unspecified	138	33	282	74
Gonorrhea	18,249		35,948	
Influenza	400		869	
Malaria	226	1	493	1
Measles	3,636		7,016	
Meningitis, epidemic	174	41	334	79
Paratyphoid fever	114	9	301	17
Pneumonia	16,818		34,269	
Scarlet fever	171	2	457	4
Smallpox	4	0	6	0
Syphilis	16,071		31,403	
Tuberculosis	23,422		44,772	
Typhoid fever	408	59	961	117
Typhus fever	86	7	182	16
Whooping cough	3,402		7,029	

NOTE.—The above figures have been adjusted to include delayed and corrected reports.

NORWAY

Notifiable diseases—December 1947.—During the month of December 1947, cases of certain notifiable diseases were reported in Norway as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	14	Measles	51
Diphtheria	78	Mumps	2, 908
Dysentery	7	Pneumonia (all forms)	1, 999
Encephalitis, epidemic	5	Poliomyelitis	17
Erysipelas	435	Rheumatic fever	114
Gastroenteritis	2, 996	Scabies	3, 604
Gonorrhea	454	Scarlet fever	336
Hepatitis, epidemic	169	Syphilis	124
Impetigo contagiosa	3, 526	Tuberculosis (all forms)	410
Influenza	2, 654	Typhoid fever	2
Laryngitis, including bronchitis	10, 778	Whooping cough	368
Malaria	2		

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

Cholera

Indochina (French)—Cochinchina—Rachgia.—For the period March 1–10, 1948, 32 cases of cholera with 20 deaths were reported in Rachgia, Cochinchina, French Indochina.

Plague

Belgian Congo—Stanleyville Province.—On March 20, 1948, 1 fatal case of plague was reported in Stanleyville Province, Belgian Congo, northeast of Blukwa. The last cases of plague previously reported from Belgian Congo were 1 case each on January 17 and January 24, 1948, both in Stanleyville Province.

Ecuador—Chimborazo Province—Alausi Canton—Allpachaca Farm.—On February 17, 1948, 1 fatal case of plague was reported from Allpachaca Farm, Alausi Canton, Chimborazo Province, Ecuador.

India.—Plague has been reported in India as follows: For the week ended March 13, 1948, 22 cases with 6 deaths were reported in Lucknow, and information received March 30, 1948, reports 9 cases with 4 deaths in Sewri, a suburb of Bombay.

Smallpox

Ceylon—Colombo.—Information dated March 15, 1948, reports 6 cases of smallpox in Colombo, Ceylon, imported from India. (Last reported case in Ceylon, January 4, 1947).

China—Shanghai.—For the week ended March 20, 1948, 182 cases of smallpox with 43 deaths were reported in Shanghai, China.

Colombia.—For the month of February 1948, 534 cases of smallpox with 7 deaths were reported in Colombia.

Ecuador.—For the month of February 1948, 362 cases of smallpox with 13 deaths, were reported in Ecuador, including 25 cases in Guayaquil, 21 cases in Manta, and 19 cases, 2 deaths in Quito.

India—Calcutta.—Smallpox has been reported in Calcutta, India, as follows: Week ended March 13, 1948, 328 cases; week ended March 20, 1948, 344 cases.

Indochina (French)—Annam State.—For the period March 11–20, 1948, 136 cases of smallpox with 41 deaths were reported in Annam State, French Indochina.

Typhus Fever

Colombia.—For the month of February 1948, 300 cases of typhus fever with 11 deaths were reported in Colombia.

Yellow Fever

Colombia.—For the month of February 1948, yellow fever was reported in Colombia as follows: Antioquia Department—Maceo, 2 fatal cases, Yolombo, 1 fatal case; Boyaca Department, Campohermoso, 1 fatal case; Cundinamarca Department, 3 fatal cases.

×

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1948

For sale by the Superintendent of Documents, Washington 25, D. C.

Price 10 cents. Subscription price $4.00 a year.

8 JUL 1948

Public Health Reports

VOLUME 63 APRIL 30, 1948 NUMBER 18

IN THIS ISSUE

The Public Health Service Malaria Control Program

Effects of Fluoride on Different Teeth

Diphtheria Epidemic in Utah in 1947

"Minimus" Type Diphtheria in Utah

1798

FEDERAL SECURITY AGENCY

PUBLIC HEALTH SERVICE

FEDERAL SECURITY AGENCY

OSCAR R. EWING, *Administrator*

PUBLIC HEALTH SERVICE

LEONARD A. SCHEELE, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

CONTENTS

Page

Operation of the United States Public Health Service malaria control program. Frank Tetzlaff ---- 557

Dental effects of community waters accidentally flourinated for nineteen years. Part II. Differences in the extent of caries reduction among the different types of permanent teeth. Henry Klein ---- 563

Diphtheria epidemic in Utah in 1947. A. A. Jenkins ---- 573

Appearance of "minimus" type diphtheria in Utah. Ted W. Galbraith, R. S. Fraser, and E. H. Bramhall ---- 577

Deaths during week ended April 3, 1948 ---- 579

INCIDENCE OF DISEASE

United States:
- Reports from States for week ended April 10, 1948, and comparison with former years ---- 580
- Weekly reports from cities:
  - City reports for week ended April 3, 1948 ---- 584
  - Rates, by geographic divisions, for a group of selected cities ---- 586
- Territories and possessions:
  - Hawaii Territory—Plague (rodent) ---- 586

Foreign reports:
- World distribution of cholera, plague, smallpox, typhus fever, and yellow fever—
  - Cholera ---- 587
  - Plague ---- 588
  - Smallpox ---- 589
  - Typhus fever ---- 591
  - Yellow fever ---- 592

Public Health Reports

Vol. 63 ● APRIL 30, 1948 ● *No. 18*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

OPERATION OF THE UNITED STATES PUBLIC HEALTH SERVICE MALARIA CONTROL PROGRAM[1][2]

By FRANK TETZLAFF, *Sanitary Engineer, United States Public Health Service*

The United States Public Health Service has carried on its malaria control activities largely within the framework of the State health departments. Where necessary, the staffs of the State health departments were reinforced by the detail of suitable professional, subprofessional, administrative, clerical and labor personnel. This personnel, both commissioned officers and civil-service employees, became, in effect, employees of the State and local health departments. At the peak of wartime operations there were approximately 185 commissioned officers and 3,500 civil-service employees on detail to State health departments on malaria control activities. Numerous benefits resulted from this method of operation. The more outstanding are:

1. With the use of existing malaria control organizations in State health departments there was no unnecessary expenditure of funds by duplication of personnel. Existing personnel in many cases could readily take on additional duties like those already being performed. Office, garage and warehouse space frequently were available or could be expanded to accommodate an enlarged program.

2. There was no loss of time in acquiring a background of knowledge of the malaria problem and of previous malaria control activities, such as malaria surveys and drainage and larviciding projects, and prompt advantage could be taken to permit institution or expansion of control measures where needed.

3. Where no malaria control organization existed previously in State health departments and this activity was carried on as part of a general sanitation program by personnel devoting only part time, the value of personnel specializing in malaria control was demonstrated. Certainly the need for entomological guidance of the malaria control activities as well as for the guidance of programs for the control

---

[1] From the Communicable Disease Center, Atlanta, Georgia.

[2] From the paper presented at meeting of the National Malaria Society, Atlanta, Ga., December 2, 1947.

of other insect-borne diseases is now more generally acknowledged and will continue to be considered an essential part of a health department organization.

4. Most important perhaps is the almost certain result that health departments, having been so intimately connected with the wartime malaria control measures and having sponsored in most cases for the first time an operating program extremely popular with the public, will probably continue these control measures with local funds alone, if necessary.

Papers presented previously at annual meetings of this society (*1, 2*) have indicated the changing pattern of malaria control operations of the Public Health Service. The emphasis from war establishment malaria control, a program intended primarily to prevent the spread of malaria into military and war establishments from surrounding civilian areas where malaria was prevalent, has been shifted to the protection of the civilian population from malaria brought in by returning military personnel. The latter program, known as the extended program, involved the extension of malaria control activities from the immediate vicinity of purely war-important areas to all areas of relatively high malaria endemicity.

While a maximum of about 2,200 war establishments were included at the peak of the war establishment malaria control program, there has since been a drastic curtailment. Malaria control activities or merely surveillance were conducted during the 1947 season in the vicinity of only 73 military areas and 40 Veterans' Administration facilities throughout the United States. At present it does not seem that this number of military establishments requiring malaria control or surveillance will be reduced considerably. This control and surveillance ordinarily are conducted by the Communicable Disease Center of the Public Health Service with the cooperation of or through the State malaria control organization where there is such an organization. Some military areas requiring malaria control or surveillance, however, are located in States which do not have such organizations. In such cases personnel have been made available in the District offices of the Public Health Service either to do the surveillance or control or to arrange for it to be carried on locally.

With the shift of the Public Health Service malaria control program to the extended program there was also a change in the control procedures. War malaria control was conducted primarily by means of larviciding and drainage. The transition to extended malaria control occurred at a time during the war when DDT was just being made more available for civilian use, or at least for war-essential civilian use. This factor undoubtedly influenced and encouraged the transition since the objective of protecting civilian populations from outbreaks due to returning military malaria carriers could obviously be achieved much more readily and positively by such control measures. With the more general availability of DDT, it was possible to contemplate the use of residual DDT spray treatment of homes as a malaria control procedure almost to the exclusion of other measures such as drainage and larviciding.

Funds allocated to the United States Public Health Service for the malaria control program were apportioned to the States on the basis of the malaria problem in the States concerned. Use of these funds was limited largely to areas preapproved for operations—the areas being delineated substantially by a determination of the average annual malaria death rates for the various counties weighted by a factor for population density and further modified by evidence subsequently submitted by State health authorities.

At the start of the residual DDT spraying program in 1945, an average annual death rate of 10 or more per 100,000 population (during the period 1938–42) was used as the criterion for establishing a list of counties preapproved for operations. Although some States from the beginning insisted that local areas participate in the cost of the residual spraying operations, in many States Federal funds paid for almost the entire cost of the program. Where this was the case it was soon apparent that the Federal funds available probably would not be adequate to establish the residual spraying program in the entire preapproved area. It was urged, therefore, that local funds be solicited or be made available in some way to permit expansion of the program to all areas shown to be in need of the malaria control program.

Local participation made it possible during the 1947 season to reduce the criterion for operations to counties having an average annual death rate of 5 or more per 100,000 population.

There was no uniform method of securing the State and local participation. The methods of participation varied extensively, depending on the malaria problem, the local interest, and other conditions peculiar to the particular area.

Three principal methods of obtaining local participation in the malaria control program were used:

1. The county or city government provided funds from general taxation or special tax levies for labor and transportation costs. Federal funds, in such cases, were used to furnish supervisory personnel, spraying equipment and chemicals. This method has been perhaps the most satisfactory one from an organizational standpoint.
2. Some State legislatures appropriated funds for the malaria-control program. These funds were expended under the direction of the State health officer. Although convenient from the standpoint of avoiding the necessity of collection of funds, this method is, in some cases, difficult to administer, since legislators often assume the money will be spent throughout the State instead of being limited to areas where malaria is considered a problem by the State health department.

3. In some States, local participation in the malaria-control program has been obtained by collection of fees from the owners of homes in which the DDT residual spray was applied. Obviously the cost of collecting the funds under this method is considerable. Hence, the unit cost for residual DDT spray applications is above the average for the two methods outlined previously. Although it might be expected that the inability to pay the fee could result in a considerable number of homes in an area requiring protection being deprived of such protection, actual experience has shown that despite fees of from $0.50 to $3.25 per house there is very little difference between the coverage secured by this method of participation from that in other programs. The coverage in all States has varied from 70 to 80 percent of the homes in an area being sprayed, with refusals being due mainly to vacancies, adequate screening, illness in the family, or other reasons not pertaining to ability to pay a fee. It is likely, however, that a change in economic conditions might result in wholesale failure of a program based on this type of participation.

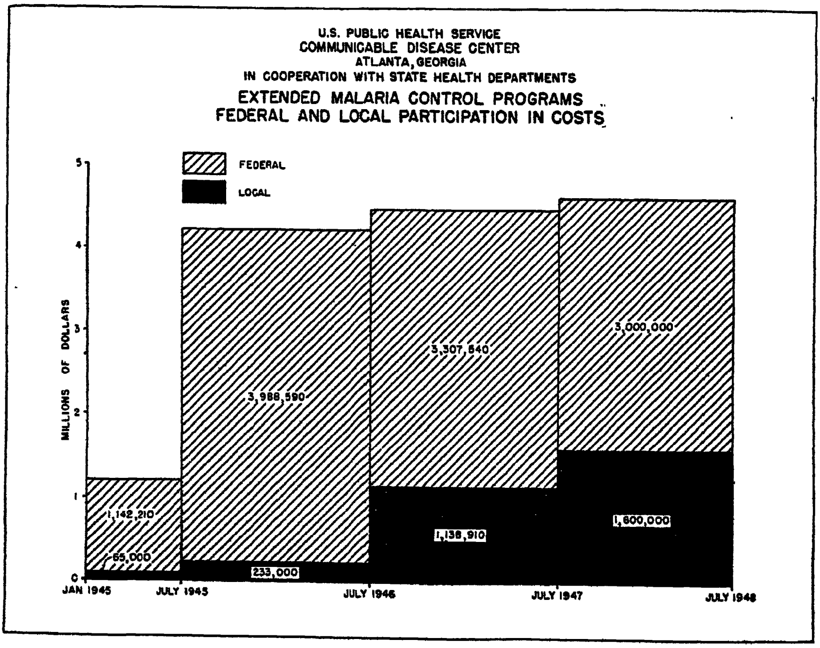


FIGURE 1.

With local participation in the cost of operations steadily increasing to a present participation rate of about 31 percent (fig. 1) it has been possible to expand the residual spraying program proportionately (table 1). Considerable expansion also has been made possible by increasing economy of operations. The average time required to treat one unit has been reduced from approximately 1.75 to 1.19 man-hours. More efficient operations have resulted from equipment developments and crew organization. Many of these improvements were initiated in the field. Improvements in hand spraying equipment have been particularly important in the elimination of time lost due to breakdown of equipment.

TABLE 1.—*Summary of residual house-spraying operations 1945–48, all States November 1947*

CALENDAR YEARS

Year	Number of counties	Number house spray applications	Pounds (DDT)	Pounds (DDT per house)	Man hours per house
1945	121	678,032	305,824	0.45	1.75
1946	267	1,166.572	918,125	.79	1.35
1947 (Sept. 27)	307	1,234,318	999,617	.81	1.20
FISCAL YEARS					
1945	111	264,482	103,957	0.39	1.75
1946	266	1,055,397	715,656	.68	1.55
1947	297	1,236,841	964,449	.78	1.28
1948[1]	300	1,000,000	1,250,000	1.25	1.00

[1] Estimated.

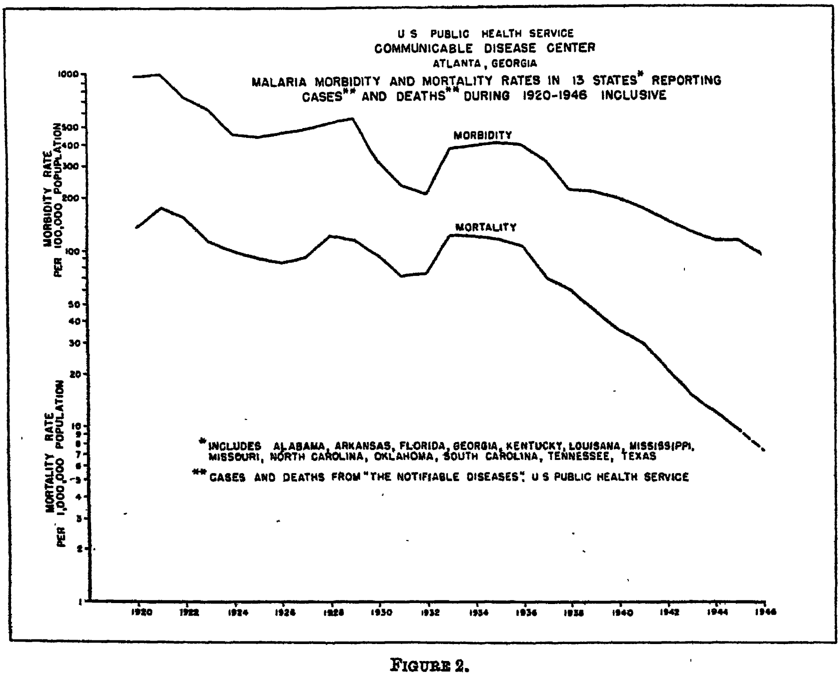
Some economies in the operational program may have had undesirable effects. A reduction in the emphasis on educational activities may, in some measure, be responsible for complaints which are now being received concerning the ineffectiveness of the DDT spray program as compared with previous years. People whose homes are being sprayed are forgetting that the purpose of the program is malaria control and not primarily fly control. It is true, however, that the incidental fly control resulting from the residual DDT spraying program undoubtedly has been one of the major factors in the ready acceptance and the success of the spraying program. It is possible that we should expect an eventual extension of this activity to provide control of all insects having public health significance.

Such a program is under consideration now. It would involve entire premise treatment; the spraying of all structures in which mosquitoes rest, such as barns, chicken coops, stables, sheds, in addition to home interiors, porches and privies. Undoubtedly it would be more acceptable than the present program which is directed specifically against those mosquitoes which are most likely to be malaria vectors. Because of the excellent results of our present program thus far, however, there is considerable doubt that under present conditions the additional expense of entire premise spraying against *quadrimaculatus* transmitted malaria is warranted. Nevertheless, it readily is admitted that such spraying might be desirable since the hazard of malaria transmission would be still further reduced and also might accomplish our aim in a shorter period of time. In addition, the increase in the degree of fly control achieved would be significant and would lead to a wider acceptance of the program.

Consideration has also been given to the value of spraying back and under surfaces of furniture. Preliminary results, as might be expected, indicate more rapid and perhaps more complete knockdown of adult mosquitoes. This modification of the DDT residual spray technique, however, like entire premise spraying, would also result in higher labor costs, especially by reason of the likelihood that furniture finishes may be marred in the process and require refinishing.

Although the rate of DDT application has in most States been 200 milligrams per square foot of sprayed surface there has been some variation among the States, with rates of 100 and even 300 milligrams of DDT per square foot having been used. The higher application rate has been used, particularly in some small areas, to determine the effectiveness of a single spray application for an entire season. A comparison of the effectiveness of these variations in the program is making it possible to determine which variations will lead to more economical operation. A considerable saving may be possible in labor costs if areas using a single spray application are shown to have had adequate protection by this variation of the program.

During the past 3 years the residual DDT spray operations have been expanded to the extent that they are now substantially covering the areas in the United States in which malaria has been a significant problem. Most States are applying residual DDT spray to the home of any confirmed case of malaria. Usually a blood slide confirmation of the case is required if the home to be sprayed is outside of the areas preapproved for malaria control operations. The incidence of malaria has continued to decrease in the areas treated with DDT and is now at the lowest point since records have been kept (figure 2).



U S PUBLIC HEALTH SERVICE
COMMUNICABLE DISEASE CENTER
ATLANTA, GEORGIA
MALARIA MORBIDITY AND MORTALITY RATES IN 13 STATES* REPORTING CASES** AND DEATHS** DURING 1920-1946 INCLUSIVE

*INCLUDES ALABAMA, ARKANSAS, FLORIDA, GEORGIA, KENTUCKY, LOUISANA, MISSISSIPPI, MISSOURI, NORTH CAROLINA, OKLAHOMA, SOUTH CAROLINA, TENNESSEE, TEXAS

**CASES AND DEATHS FROM "THE NOTIFIABLE DISEASES", U S PUBLIC HEALTH SERVICE

FIGURE 2.

By a close coordination of the malaria control operations of the Public Health Service with State and local health department activities, by a continual striving for economies in operation, and by an increasing participation by State and local areas in the cost of operations, it has been possible to give more nearly complete coverage of the area in which malaria has been a problem in the recent past. Continuation of these activities for a reasonable period should help reduce malaria to the point where it will no longer constitute a significant public health problem in the United States. The method of operation has been such that the impetus should keep the work going despite eventual reduction in Federal participation. Finally, the pattern has been established in State and local health departments for the institution of programs for the control of other insects having public health significance.

REFERENCES

(*1*) Hollis, Mark D.: Postwar malaria control in continental United States. J. Nat. Malaria Soc. 5: 95 (1946).

(*2*) Link, Vernon B.: A preliminary report on malaria control by DDT residual spraying. J. Nat. Malaria Soc. 6: 124 (June 1947).

DENTAL EFFECTS OF COMMUNITY WATERS ACCIDENTALLY FLUORINATED FOR NINETEEN YEARS[1]

II. Differences in the Extent of Caries Reduction among the different Types of Permanent Teeth

By Henry Klein[2]

In preceding reports it was shown that children, born and reared in a New Jersey area, and who drink waters naturally containing from 1.3 to 2.2 parts per million of fluoride have, as a group, a lower than usual prevalence of dental caries experience (*1*) (*2*). However, the children are not protected all to the same extent. Those who have the least amount of caries experience have parents showing smaller than average amounts of experience with dental disease while the children who have the most caries experience (in spite of their residence in a fluoride environment) are the ones whose parents have had more than average amounts of such experience. Hence a powerful familial factor in dental caries susceptibility (*3*) is evident even in an area where fluoride is available in the community water supplies (*4*). It follows therefore, that variation exists among different children in their response to the caries-inhibitory effects of fluoride waters. Certain children are protected more, others less, and this variation is associated, among other factors, with familial susceptibility (*5*).

---

[1] From the Division of Public Health Methods, U. S. Public Health Service.

[2] Dental Public Health Administrator; at present on leave of absence as Dental Advisor, European Health Program, American-Joint Distribution Committee.

It has been demonstrated also that there exists among the different kinds of teeth (incisors, canines, premolars, and molars) different degrees of what might be termed, characteristic susceptibility to dental decay (*6*). Hence, the molars are most frequently attacked by caries while the canines are the least often involved. To what extent are these typical or expected susceptibilities of the different teeth (determined in non-fluoride areas) influenced or affected by fluoride exposure? Are all the teeth protected to the same extent or are some teeth protected more than others?

Analysis of this, and related questions, reveals that the various morphological types of teeth in the permanent dentition are indeed affected differently by exposure to fluoride. Certain teeth, particularly those located in the anterior of the mouth, are protected most while the molars, which are placed most posterior in the mouth, are protected least.

FINDINGS

The study to be reported here is based on examination of nearly 2,000 children residing in New Jersey and more than 6,000 children of Hagerstown, Md. Of the total of New Jersey children ranging in age from 5 to 19 years, 874 were born and reared in a fluoride area (lifetime residents), 725 moved into the fluoride area at various ages subsequent to birth in places outside the fluoride areas (migrants) and 340 children were lifetime residents of the non-fluoride area (table 1).

TABLE 1.—*Number of white children (both sexes) examined*

Item specified	Age (years)															
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	All
Fluoride:																
Lifetime	71	73	97	84	83	65	53	51	60	53	61	63	39	15	6	874
Migrants	21	57	52	56	48	53	72	50	59	73	65	49	43	21	6	725
Nonfluoride:																
Hagerstown (migrants and lifetime)	----	327	403	487	493	529	531	596	565	695	651	445	355	148	32	6,257
Williamstown-Clayton (lifetime)	10	28	30	43	41	24	21	26	32	23	27	15	15	5	----	340

Each child was examined under good light with mirror and explorer. The number of DMF teeth [3] per 100 children of particular ages for each of the pairs of the seven kinds of teeth in the mandible and maxilla (excluding the third molars) are shown in table 2 for lifetime residents and for migrants in the fluoride area. For comparison corresponding DMF rates of children of the same ages are given in the same table for two nonfluoride areas: Hagerstown, Maryland, and Williamstown and Clayton, New Jersey.

---

[3] The symbol "DMF" first introduced by the author in the year 1937 (7) and now widely used indicates decayed, missing and filled permanent teeth.

Dr. John F. Cody, dental officer, Public Health Service, made all the examinations reported; both those in Hagerstown, Md. and those in New Jersey.

Williamstown and Clayton were originally selected as the comparison areas (nonfluoride). However, as shown in table 2 and elsewhere (*8*), the Williamstown-Clayton children have excessively high DMF rates and therefore cannot be considered as representative of a nonfluoride area especially since evidence is available (*8*) to suggest that the Williamstown-Clayton waters contain principles which may accelerate caries attack. However, the DMF rates for Hagerstown children agree rather closely with those obtained for San Francisco (*9*) and New York City children (*10*). Hence, the Hagerstown DMF rates may be tentatively accepted as representative of nonfluoride areas and are used here for comparison with the fluoride area in New Jersey.

TABLE 2.—*Number of DMF teeth per 100 white children (both sexes), by age groups*

Item specified	Age	Maxillary teeth left and right sides							Mandibular teeth left and right sides							All [1]
		CI	LI	C	PM_1	PM_2	M_1	M_2	CI	LI	C	PM_1	PM_2	M_1	M_2	
Fluoride: Lifetime	5–9	1.5	0	0	0	0	8.3	0	0	0	0	0	0	7.2	0	17.0
	10–14	.7	1.8	1.8	4.6	3.2	36.5	5.3	0	0	0	1.8	3.2	59.9	13.1	131.9
	15–19	7.1	8.2	2.2	10.3	16.3	68.5	39.7	.5	0	0	4.9	10.9	11.9	79.3	358.7
Migrants	5–9	0	0	0	0	0	19.2	0	0	0	0	0	.4	32.1	0	51.7
	10–14	9.1	10.4	0	6.2	6.8	96.1	13.7	1.0	.3	.3	2.0	7.5	119.5	32.6	305.5
	15–19	36.4	33.2	6.0	30.4	31.5	124.5	58.2	2.2	1.6	1.6	10.3	28.3	142.4	87.0	593.5
Nonfluoride: Hagerstown (Lifetime and migrants)	5–9	2.2	1.8	.1	.8	.4	28.4	0	.4	.2	0	.2	.6	49.6	0	84.7
	10–14	25.2	23.2	1.4	11.3	11.2	106.0	15.0	6.2	2.4	.2	2.4	9.2	139.6	33.6	386.9
	15–19	47.6	52.8	11.4	41.6	45.4	141.0	87.0	6.8	6.0	2.4	11.2	39.8	169.8	119.2	782.0
Williamstown-Clayton (lifetime)	5–9	1.3	1.3	0	1.3	1.3	64.5	0	1.3	1.3	0	.7	.7	95.4	.7	169.8
	10–14	42.1	42.9	5.6	18.3	22.2	140.5	36.5	9.5	8.7	2.4	7.1	20.6	160.3	81.0	597.7
	15–19	82.3	75.8	24.2	75.8	82.3	164.5	116.1	11.3	9.7	3.2	24.2	66.1	183.9	150.0	1,069.4

[1] Summation of the individual DMF teeth to give total DMF teeth of all kinds per 100 children of given age groups.

Lifetime exposure to fluoride.—As shown in table 2, the 5- to 9-year-old-lifetime residents of the fluoride area average about 17 DMF teeth per 100 children. The migrants of the same ages average three times as many DMF teeth while children of the same ages in Hagerstown average about five times as many more DMF teeth as do the lifetime residents of the fluoride area. Inspection of the data given in table 2, and study of figures 1 and 2, reveal that (with but a few exceptions), for each kind of tooth at each age level, the DMF rates of the migrants are lower than those of Hagerstown children, while the DMF rates of the lifetime residents are in turn lower than the corresponding rates of the migrants. The Williamstown-Clayton children have the highest DMF rates for each kind of tooth (table 2).

Equally evident is the finding that all the different kinds of teeth are not protected by the fluoride waters to the same extent. The discussion at this point will deal only with findings on 15- to 19-year-old children who are lifetime residents as compared with the findings for children of the same ages, in Hagerstown, and in Williamstown and Clayton. Hagerstown children average nearly 48 DMF upper central incisors in contrast to only 7 DMF upper central incisors among the lifetime residents of the fluoride area. This is approximately a sevenfold difference. As between the two groups, the upper lateral incisors show more than a sixfold difference, the upper canines a fivefold difference, the upper first premolars a fourfold difference and the upper second premolars a threefold difference while the amount of caries experienced in the upper molars as between the two areas, represents approximately a twofold difference for 15- to 19-year-old children.

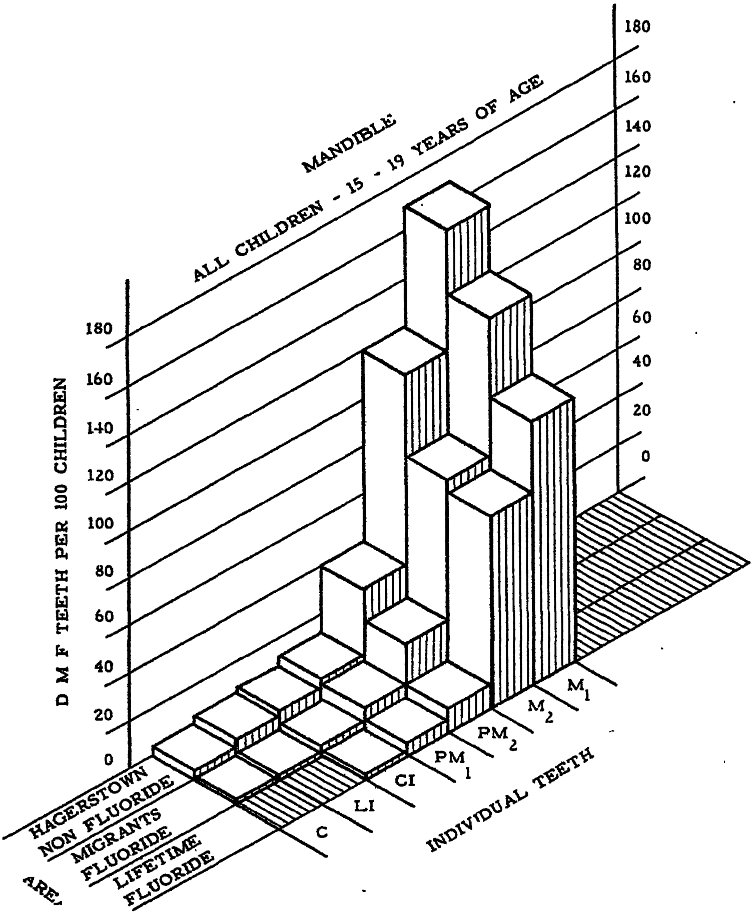


FIGURE 1.—Number of DMF teeth of specified kinds, left and right sides of the lower jaw (mandible) per 100 children of both sexes, 15–19 years of age; by specified areas and residence history. CI—central incisor, LI—lateral incisor, C—canine, PM—first premolar, PM_2—second premolar, M—first molar, M_2—second molar.

Using Williamstown-Clayton for comparison with the fluoride area it is found that the difference in the DMF rates for the upper central incisors is nearly twelvefold, for the upper laterals the difference is ninefold, for the upper canines it is twelvefold, the upper first premolar difference is sevenfold, the upper second premolar is fivefold, the upper first molar is more than twofold and the upper second molar is more than twofold for 15- to 19-year-old children.

In the lower jaw the differences between Hagerstown and the New Jersey fluoride lifetime residents 15 to 19 years of age represents a more than tenfold difference for the central and lateral incisors and canines, about a twofold difference for the first premolars, more than a threefold difference for the second premolars but less than a twofold difference for the molars.

If the comparison is made in terms of the New Jersey fluoride lifetime residents 15 to 19 years of age and children of the same ages who are lifetime residents of the nonfluoride area in New Jersey (Williams-

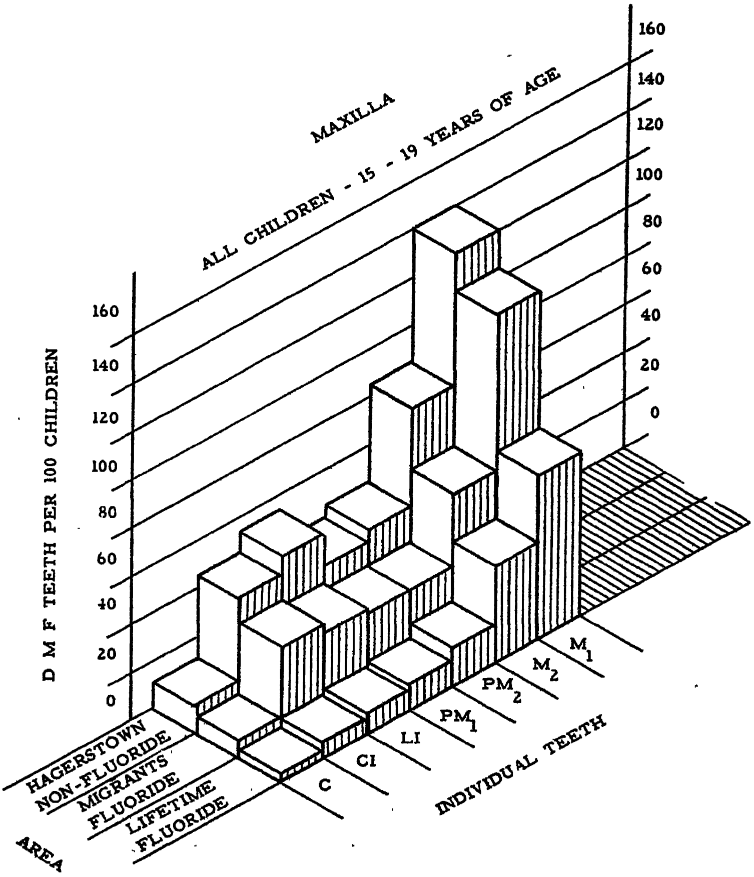


FIGURE 2.—Number of DMF teeth of specified kinds, left and right sides of the upper jaw (maxilla) per 100 children of both sexes, 15-19 years of age; by specified areas and residence history. CI—central incisor, LI—lateral incisor, C—canine, PM—first premolar, PM_2—second premolar, M—first molar, M_2—second molar.

town and Clayton), the differences between the DMF rates for the lower teeth are as follows: Central incisors, twenty-twofold; first premolars, nearly fivefold; second premolars, sixfold; first molars, 1.7 times and the second molars, 1.9 times.

From these findings, it becomes clear that exposure to fluoride waters over a life time of 15–19 years will reduce the amount of caries experience in each type of tooth; but to a different extent for the various types. The DMF experience of the molars is affected least while that of the upper and lower incisors and canines is affected most.[4] These differences between the DMF experience rates of the individual pairs of teeth as between Hagerstown and lifetime residents of the fluoride area can be expressed also as the absolute difference, and as the percent reduction below the Hagerstown rates as shown in table 3 and figure 3. Hence, among lifetime residents of the fluoride area, caries experience is reduced 100 percent below the expected rate (Hagerstown) in the lower lateral incisors and canines.[5]

TABLE 3.—*Absolute differences and percent reduction in the DMF rates for 15–19 year-old children (both sexes)*

ABSOLUTE DIFFERENCE IN DMF RATES

Item specified	Maxillary teeth left and right sides							Mandibular teeth left and right sides						
	CI	LI	C	PM_1	PM_2	M_1	M_2	CI	LI	C	PM_1	PM_2	M_1	M_2
Between Williamstown-Clayton (nonfluoride) and the fluoride areas in New Jersey	75.2	67.6	22.0	65.5	66.2	96.0	76.4	10.8	9.7	3.2	19.3	55.2	73.0	70.7
Between Hagerstown and the fluoride areas in New Jersey	40.5	44.6	9.2	31.3	29.1	72.5	47.3	6.3	6.0	2.4	6.3	28.9	58.9	39.9
PERCENT REDUCTION IN DMF RATES														
Between Williamstown-Clayton (nonfluoride) and the fluoride areas in New Jersey	91.4	89.2	90.9	86.4	80.4	58.4	65.8	95.6	100.0	100.0	79.8	83.5	39.7	47.1
Between Hagerstown and the fluoride areas in New Jersey	85.1	84.5	80.7	75.2	64.1	51.4	54.3	92.6	100.0	100.0	56.2	72.6	34.7	33.5

There is a nearly 93-percent reduction for the lower central incisors, and approximately an 85-percent reduction for the upper central and lateral incisors, an 80-percent reduction for the upper canines, more than a 70-percent reduction for the upper first and lower second premolars, a 64-percent reduction for the upper first premolars. The smallest reduction below the Hagerstown rate is shown by the lower first and second molars in which about a 33-percent reduction is achieved by a lifetime exposure in the fluoride area. The percentage reduction in the DMF rates of the lifetime residents in the fluoride versus the nonfluoride areas of New Jersey are also shown in table 3.

---

[4] Observations on DMF experience in the upper anterior teeth have been reported by other workers (*11*) (*12*).

[5] It is necessary to point out here that, where the reduction in the number of DMF teeth is 100 percent, this fact does not indicate an absolute protective power of fluoride waters but rather reflects sampling fluctuations due to a relatively small number of cases.

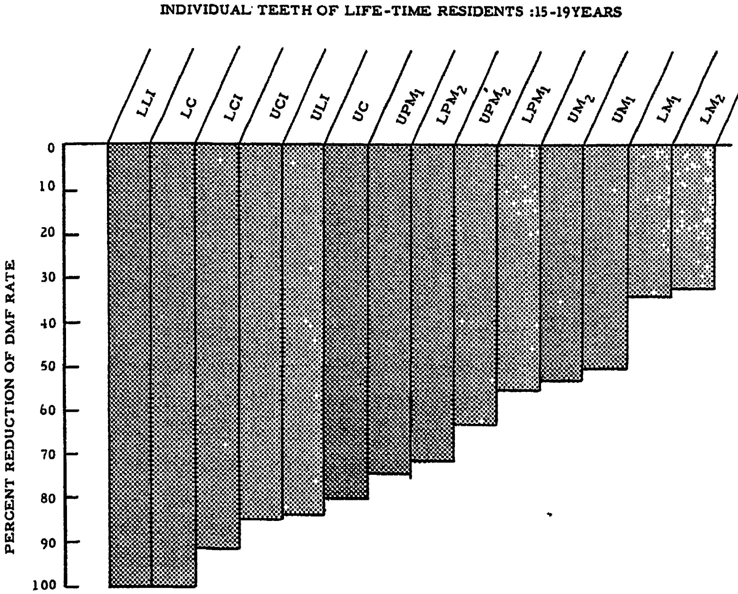


FIGURE 3.—Percent reduction below corresponding rates for Hagerstown children in number of DMF teeth of specified kinds, left and right sides of the upper and lower jaws (maxilla and mandible) per 100 children of both sexes, 15-19 years of age, lifetime residents of a fluoride area of New Jersey. LLI—lower lateral incisor, LC—lower canine, LCI—lower central incisor, UCI—upper central incisor, ULI—upper lateral incisor, UC—upper canine, UPM—upper first premolar, LPM$_2$—lower second premolar, UPM$_2$—upper second premolar, LPM—lower first premolar, UM$_2$—upper second molar, UM$_1$—upper first molar, LM—lower first molar, LM$_2$—lower second molar.

Various durations of exposure to fluoride.—Analyses of DMF findings on migrants exposed in a fluoride area may be viewed as providing information from which some of the effects of artificial fluorination may be anticipated. Migrants establishing residence in a fluoride area and consuming the waters containing fluoride may be considered perhaps as the equivalent of persons residing in a non-fluoride area but to whom subsequently fluoride exposure is provided by artificial fluorination of their water supplies.

As shown previously, the teeth of migrants are protected against caries by the fluoride waters. It has also been shown that the extent to which caries incidence among migrants is depressed is, among others variables, a function of (*a*) their age at time of arrival in the area and (*b*) the length of time they stay in the area (*1*) (*8*).

The question at this point in the discussion deals more specifically with the effect of duration of exposure in a fluoride area on the caries experience of the individual types of teeth among the migrants. Material bearing on that question is shown in table 4 and in figures 4 and 5.

From these data, it becomes evident that among children migrating to and establishing residence within a fluoride area of New Jersey, certain teeth are protected against caries attack more than are other

TABLE 4.—*Number of migrants and number of DMF teeth per 100 children (both sexes) and the duration of exposure in a fluoride area of New Jersey*

Age (years)	Exposure (years)	Number persons	Maxillary teeth left and right sides							Mandibular teeth left and right sides						
			CI	LI	C	PM₁	PM₂	M₁	M₂	CI	LI	C	PM₁	PM₂	M₁	M₂
5-9	0-4	175	0	0	0	0	0	21.7	0	0	0	0	0	0.6	35.4	0
	5-9	59	0	0	0	0	0	11.9	0	0	0	0	0	0	22.0	0
10-14	0-4	136	14.0	16.9	0	8.8	8.1	123.5	17.6	2.2	.7	.7	1.5	10.3	148.5	41.2
	5-9	118	5.1	4.2	0	4.2	5.9	83.9	11.0	0	0	0	0	4.2	103.4	26.3
	10-14	53	5.7	7.5	0	3.8	5.7	52.8	5.7	0	0	0	7.5	7.5	81.1	24.5
15-19	0-4	45	51.1	48.9	11.1	40.0	51.1	128.9	71.1	2.2	0	0	20.0	55.6	148.9	108.9
	5-9	67	46.3	38.8	9.0	34.3	25.4	147.8	61.2	1.5	1.5	3.0	6.0	28.4	155.2	91.0
	10-14	58	22.4	22.4	0	22.4	29.3	113.8	56.9	3.4	3.4	1.7	10.3	13.8	139.7	77.6
	15-19	14	0	0	0	14.3	7.1	42.9	7.1	0	0	0	0	0	71.4	35.7

teeth. It is clear that the children arriving at the earliest ages and exposed the longest time (and therefore the teeth earliest and longest exposed) have significantly lower amounts of DMF experience than do the children (and their individual types of teeth) most recently arrived and shortest exposed in the area.

As was true of life-time residents in the fluoride area, so with the migrants, caries experience is least retarded in the lower molar teeth

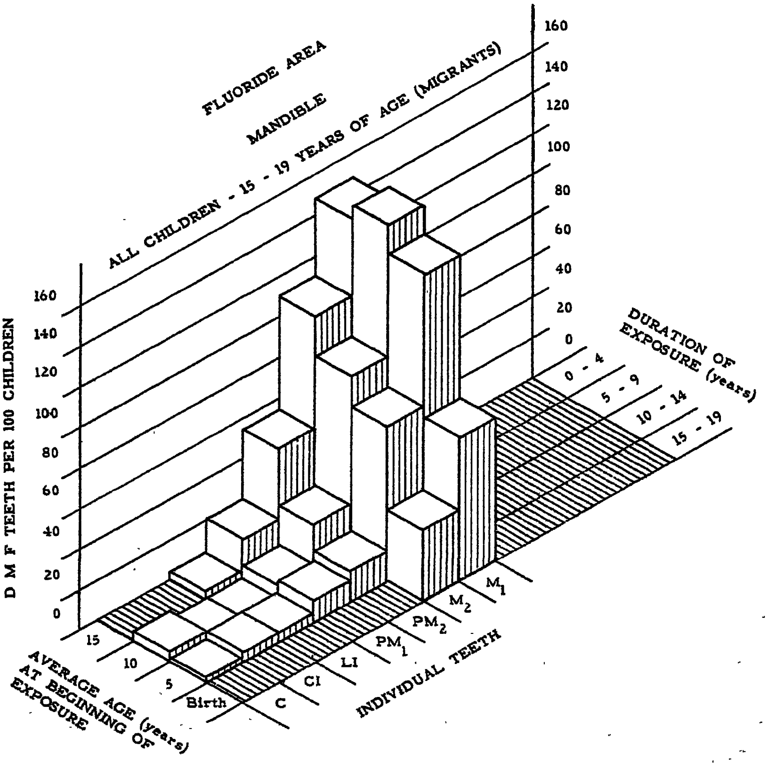


FIGURE 4.—Number of DMF teeth of specified kinds, left and right sides of the lower jaw (mandible) per 100 children of both sexes, 15–19 years of age; by duration of exposure in a fluoride area of New Jersey. CI—central incisor, LI—lateral incisor, C—canine, PM—first premolar, PM_2—second premolar, M—first molar, M_2—second molar.

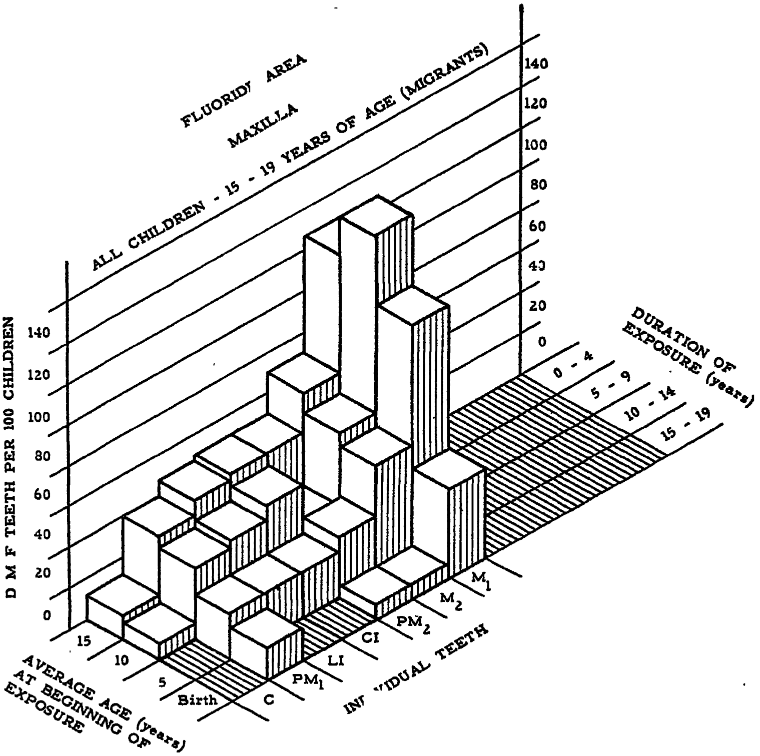


FIGURE 5.—Number of DMF teeth of specified kinds, left and right sides of the upper jaw (maxilla) per 100 children of both sexes, 15–19 years of age; by duration of exposure in a fluoride area of New Jersey. CI—central incisor, LI—lateral incisor, C—canine, PM—first premolar, PM_2—second premolar, M—first molar, M_2—second molar.

by exposure in the fluoride area, while the upper and lower anterior teeth are most protected. The extent to which caries experience is reduced in the different teeth is determined more or less quantitatively by duration of exposure and age at first arrival in the area (figs. 4 and 5). Computations show that as between the longest and shortest exposed among the migrants, caries experience is reduced 100 percent in the upper and lower anterior teeth (incisors and canines), approximately 86 percent in the upper first premolars, about 66 percent in the upper first molars and a little more than 50 percent in the lower first molars.

The values derived here for the percentage reduction in the DMF rates of the different teeth should not be accepted as firmly established predictable values. As shown in the present report, the percentage reduction values are based on Hagerstown DMF rates which are accepted only tentatively as representative of nonfluoride areas. Accordingly, the data presented here are meant only to serve as illustrations of the finding that fluoride exposure does not protect all the different teeth to the same extent, but rather provides a greater effect on anterior teeth than on teeth located more posterior in the mouth.

COMMENT

It is now generally accepted that children born and reared in an area where they consume waters containing 1 to 2 parts per million of naturally occurring fluoride have, as a group, a lower prevalence of caries experience than children born and reared in a nonfluoride area such as Hagerstown, Md. Furthermore, children not born in a fluoride area, but migrating and establishing residence therein are also protected against caries attack; but to an extent which is determined more or less quantitatively by age at time of arrival, and the length of time they are resident in the fluoride area (*1*) (*8*).

The depressant effect of fluorides on caries may be approximately of equal potential for all the different types of teeth. However, because of the different gradients in the characteristic or expected caries susceptibilities of the different teeth, the resultant effect may be a variation in the percent reduction of caries among the different teeth, such as described above for the New Jersey children. Consideration of the differences in caries reduction among the different teeth leads to the view that the differential effects are perhaps related to basic differences in the characteristic susceptibilities of the different teeth. By this speculation, it would follow that the tooth most protected by exposure to fluoride would be that tooth having the strongest natural resistance to caries attack; the tooth least protected would be the tooth having the strongest natural tendency to be attacked by caries. The findings described here suggest such an explanation. Analyses designed to identify the relationship between tooth-specific caries susceptibility and the caries-inhibitory effect of fluoride will be given in a subsequent report.

From a practical point of view, the findings direct attention to the pertinent observation that even after prenatal exposure and a postnatal residence of 15–19 years in a fluoride environment, caries attack is reduced only by about a third of normal expectation in the lower molar teeth of lifetime residents. Although this is a significant reduction, particularly from the point of view of the total need for dental service in the population, it is necessary to recognize that approximately two-thirds of the treatment problem for caries still arises among molars in the fluoride area; a phenomenon which probably explains why practicing dentists in that area did not, previous to the present study, independently consider that the teeth of their patients were uniquely different from those of other children in the United States.

REFERENCES

(*1*) Klein, Henry: Dental effect of community waters accidentally fluorinated for 19 years. I. Dental caries experience in the deciduous and permanent teeth of school age children. J. Am. Dent. A. in press (1948).

(*2*) Wisan, J. M.: Public Health News (New Jersey) **27:** 139 (1944).

(*3*) Klein, Henry: The family and dental disease. IV. Dental disease (DMF) experience in parents and offspring. J. Am. Dent. A. **33:** 735 (1946).

(*4*) —— Ibid. V. Caries experience among parents and offspring exposed to drinking water containing fluoride. Pub. Health Rep. **62:** 1247 (1947).

(*5*) Puffer, R. R.: Family susceptibility to tuberculosis. Harvard University Press, Cambridge, Mass. 1944.

(*6*) Klein, Henry, and Palmer, C. E.: Studies on dental caries. XII. Comparison of the caries susceptibility of the various morphological types of permanent teeth. J. Dent. Research **20:** 203 (1941).

(*7*) Klein, Henry, and Palmer, C. E.: Dental caries in American Indian children. Pub. Health Bull. No. 239. U. S. Government Printing Office, Washington, D. C. (1937).

(*8*) Klein, Henry: Do certain drinking waters favor dental caries? Science **105:** 4 (1947).

(*9*) Sloman, E. G., and Sharp, J. B.: Extent of dental caries and condition of teeth of San Francisco high school students. J. Cal. State Dental Assoc. **15:** May-June (1940).

(*10*) Klein, Henry, and Palmer, C. E.: Medical evaluation of nutritional status. X. Susceptibility to dental caries and family income. Milbank Memorial Fund Quart. **20:** 169 (1942).

(*11*) Dean, H. T.; Jay, Philip; Arnold, Francis A.; McClure, Frank J.; and Elvove, Elias: Domestic water and dental caries including certain epidemiological aspects of oral L. acidophilus. Pub. Health Rep. **54:** 862 (1939).

(*12*) Arnim, S. S.; Aberle, S. D.; and Pitney, E. H.: A study of dental changes in a group of Pueblo Indian children. J. Am. Dent. A. **24:** 478 (1937).

DIPHTHERIA EPIDEMIC IN UTAH IN 1947[1]

By Alton A. Jenkins, M. D., *Director, Division of Epidemiology*

During 1947 there was a diphtheria epidemic in Utah with 117 resident cases, including 11 deaths. While that number is small, it is the largest number of cases of diphtheria in any 1 year during the past 10 years (table 1). The yearly average for the 5-year period 1941–45 is 16 cases and 1 death. From 1937 to the present epidemic the number of cases of diphtheria decreased rapidly.

TABLE 1.—*Diphtheria cases in Utah by years*

Year	Cases	Deaths	Year	Cases	Deaths
1937	305	7	1943	14	0
1938	101	6	1944	0	0
1939	30	5	1945	17	0
1940	26	0	1946	16	3
1941	35	1	1947	117	11
1942	13	3			

Several unusual events connected with this epidemic, such as the isolation of the minimus strain of *Corynebacterium diphtheriae*, the localization of the epidemic, the large number of cases among school children and older adults, and a fairly large percentage of all cases being caused by the minimus strain of *C. diphtheriae*, warrants a discussion of the epidemic at this time.

---

[1] From the Utah State Department of Health.

STRAINS OF *C. DIPHTHERIAE* ISOLATED FROM CASES

For a good many years now, the incidence of diphtheria in Utah has been practically at a minimum and during the past several years no bull-neck diphtheria cases have been reported to the State Department of Health. However, relatively early in the 1947 diphtheria epidemic, two bull-neck cases were seen and the gravis strain of *C. diphtheriae* was isolated in each instance. It may be of passing interest to mention that one of the bull-neck cases was a school boy 6 years of age who was immunized against diphtheria 1 year prior to the onset of his illness with two injections of an alum precipitated diphtheria toxoid administered about 1 month apart. This case had a fatal termination. This child's grandmother, age 64 and living in the same household, was the other case. She recovered from the infection.

Our Division of Public Health Laboratories started determining the strain of the diphtheria organism on each culture received during the month of August 1947, and has continued that program to the present time.

On November 20, 1947, the minimus strain of *C. diphtheriae* was first isolated in Utah. Since then this strain has been frequently isolated from cultures obtained from cases, contacts, and other groups. However, the minimus strain of *C. diphtheriae* was isolated previously by C. Howe Eller and Martin Frobisher, Jr. (*1*) of Baltimore in 1944.

During the month of December 1947, a case of diphtheria caused by the minimus strain of *C. diphtheriae* was reported in a high school student. Subsequently, throat cultures were obtained from 72 apparently healthy students from the same high school and the minimus strain was isolated from 5 of that number.

In 93 of the 117 diphtheria cases reported in 1947, the strain of the organism was determined. Table 2 shows the number of cases and the percent for each strain.

TABLE 2.—*Cases of diphtheria by strains of* C. diphtheriae

Strain	Number of cases	Percent
Mitis	69	74.19
Minimus	17	18.28
Gravis	6	6.45
Intermedius	1	1.08
Total	93	100

The first minimus diphtheria case was reported from Uintah County, the patient being an Indian from the Uintah-Ouray Indian Reservation in eastern Utah. By race, eight of the cases were among Indians and only nine among the white population of the State, which far exceeds the Indian population.

LOCALIZATION OF EPIDEMIC

During the first 10 months of 1947, only a few sporadic cases of diphtheria occurred in the State and they were reported from several different counties.

During the latter part of October, November, and the first part of December, diphtheria cases increased rather rapidly and reached a peak during the week of December 5, when 15 cases were reported.[1] Sixty-seven, or 57 percent, of all cases occurred in Uintah County. This county has a total population of 10,200 (including Indians) which amounts to only 1.6 percent of the total population of the State of Utah (635,000).

AGE GROUPS

There were 25 cases in the 5–9 year age group and 25 cases in the 10–14 age group. These two groups account for almost 50 percent of the total number of cases On the other hand, 73 percent of all cases in which the age was given (100) occurred in children under 15 years of age and 27 percent over 15 years of age. Six or 35.3 percent of the minimus cases occurred in the age group 0–14 years and a similar number and percentage between 15 and 29 years of age.

Table 3 shows the frequency of the cases among the various age groups. It is interesting to note the several cases in the older age groups and the large number of cases among school children in the 5–14 age group.

TABLE 3.—*Diphtheria cases by age groups*

Age groups	Number of cases	Age groups	Number of cas
0–4	23	35–39	3
5–9	25	40–50	3
10–14	25	51–60	2
15–19	4	61–70	3
20–24	2		
25–29	5	Total	100
30–34	5		

DIPHTHERIA CASES CAUSED BY MINIMUS STRAIN OF *C. DIPHTHERIAE*

Of the 93 diphtheria cases in which the strain of the organism was determined, 17 cases, or 18.28 percent, were caused by the minimus strain of *C. diphtheriae*. Ten of the 17 cases were males and seven females.

It has been frequently pointed out in the literature that the incidence of diphtheria in older children and adults has been increasing over a period of years (*2*) and our figures in Utah this year substantiate those findings.

---

[1] By week of onset.

NUMBER OF DIPHTHERIA CASES PREVIOUSLY IMMUNIZED

Previous writers, including Eller and Frobisher (*1*), have pointed out the increasing frequency of the occurrence of diphtheria among those previously immunized. Thirty-six, or 30.77 percent, of all cases of diphtheria during this epidemic gave a previous history of being immunized against diphtheria. This information has been obtained from diphtheria case reports sent to the State Department of Health by the attending physicians.

Table 4 shows the immunization status of all cases and by strain for the 93 cases studied.

It is interesting to note that 10 of the 17 minimus cases were previously immunized against diphtheria and 5 of the 10 were immunized during 1946 and 1947. These numbers are small and therefore must be considered in that light.

By weeks of onset the minimus cases reached a peak twice, once during the week of November 21 and again during the week of December 5, when, in both instances, four cases were reported.

TABLE 4.—*Number of cases previously immunized*

Strain	Number of cases	Number immunized	Percent
Mitis cases	69	24	34.78
Minimus cases [1]	17	10	59.00
Gravis cases	6	1	16.67
Intermedius cases	1	0	0
Total	93	35	37.63
All cases	117	36	30.77

[1] 5 of the 10 cases were immunized during 1946 and 1947.

CASE FATALITY RATE

Complete mortality reports are not yet available for 1947, but so far there have been no deaths due to a minimus infection. Up to the present time, 11 diphtheria deaths have been reported which gives a diphtheria case fatality rate of 9.40 percent for the epidemic, which is a considerable increase over the 6.25 percent median case fatality rate for the 5-year period 1941 to 1945. Until complete mortality reports are in, it will be impossible to determine what effect, if any, the cases caused by the minimus strain of *C. diphtheriae* have had on the high fatality rate for the year.

SUMMARY

1. In 1947 there were 117 cases of diphtheria in Utah.
2. Sporadic cases were reported from various areas throughout the State during the first 10 months, but the great majority of cases occurred during late October, November, and the first part of December. Fifty-seven percent of all cases occurred in Uintah County located in the eastern part of Utah.

3. The minimus strain of *C. diphtheriae* was isolated for the first time in Utah on November 20, 1947.
4. Of all cases, 30.77 percent gave a previous history of immunization against diphtheria and 59 percent of all minimus diphtheria cases gave a history of previous immunization.
5. Twenty-seven percent of all cases in which the age was given occurred in the age group of 15 years and over.
6. Mortality statistics are not yet complete for 1947, but on the basis of provisional figures now available, the case fatality rate in this epidemic was 9.40 percent as compared with 6.25 percent which is the yearly median rate for the 5-year period, 1941 to 1945.

REFERENCE

(*1*) Eller, C. Howe and Frobisher, Martin Jr.: An outbreak of diphtheria in Baltimore in 1944 Am J. Hygiene, **42** (2):179 (1945).

(*2*) McLeod, J. W.: The types mitis, intermedius and gravis of Corynebacterium diphtheriae, Bact. Rev. **7** (1):1 (1943).

APPEARANCE OF "MINIMUS" TYPE DIPHTHERIA IN UTAH[1]

By Ted. W. Galbraith, R. S. Fraser, and E. H. Bramhall

During 1947 the number of cases of diphtheria reported in the State of Utah has shown a manifold increase. Recent laboratory isolations have outstripped the number of reported cases markedly. Therefore, this paper will deal especially with those made since November 20, 1947, as on that date a type of diphtheria bacillus new to us was first isolated and identified.

This laboratory follows the procedures usually employed in identifying *Corynebacterium diphtheriae*, i. e., Loeffler's slants, methylene blue and Gram stains, tellurite plates for purifications, pure culture studies of the reactions on various carbohydrate media, and guinea pig inoculations. Until this fall the tellurite medium was made up of bacto-tellurite blood solution and bacto-dextrose proteose #3 agar. This medium was not entirely satisfactory and a modification was evolved which yielded a greater percentage of isolations and gave colonial characteristics which aided in differentiating between the gravis, mitis and intermedius types of *C. diphtheriae*. These were the only types encountered until November 20, 1947, when a new type of colony was first seen. This colony was very small and would have been overlooked except for our routine use of a stereoscopic microscope at magnifications of 9× and 18×, using reflected light.

Subcultures from these colonies in dextrose broth failed to produce acid within 7 days. Maltose, lactose, and sucrose broth cultures also remained alkaline. Intracutaneous inoculation of guinea pigs (*1*) revealed that these organisms were of low virulence for that animal, producing only slight induration and but little erythema.

---

[1] From the Division of Laboratories, Utah State Department of Health, Salt Lake City, Utah.

These characteristics led to the belief that this small colony type must be the minimus type described by Eller and Frobisher (*2*), Frobisher et al. (*3*), and Frobisher (*4*) in 1945 and 1946. Although there has yet been no opportunity to compare our strains with those of Dr. Frobisher, the characteristics of the organisms we isolated seem to compare very closely to his criteria for recognition of the "minimus" type.

The following are the criteria we are using for naming a given strain "minimus" type.

1. On our modified tellurite medium, colonies are very small, 0.2–0.3 mm. in diameter.
2. On the above medium, young colonies are effuse, with erose to lobulate margins, grey in color and dull in appearance.
3. Older colonies on this medium are effuse but with a slightly raised circular ridge about one-third way from the periphery surrounding a crater-like depression.
4. Stained smears from Loeffler's slants show the organism to be typically short, somewhat dumb-bell shaped, generally solid staining but sometimes barred but with no metachromatic granules observed.
5. No acid was produced in dextrose broth in 72 hours. Some strains may ferment dextrose after prolonged incubation or several transfers. Maltose, lactose, and sucrose are not fermented.
6. This organism is relatively avirulent as determined by intracutaneous inoculation of guinea pigs, producing only slight induration and erythema (Fraser method).

Since November 20, diphtheria bacilli of all types have been isolated from 73 individuals. Of these, 39, or 53.3 percent, were of the minimus type and came from 14 separate communities. The clinical picture in patients from whom minimus strains have been isolated ranged from apparently normal to severe diphtheric infection including peripheral paralysis. A few cases have exhibited regional adenopathy, but not to the extent of being called "bull neck," and no deaths attributable to the minimus type have as yet been reported.

DISCUSSION

The fact that minimus strains were not recognized until November 20, 1947 does not prove that we had not dealt with them prior to that time. Indeed, in view of the fact that only this fall did we modify our tellurite medium so that type differentiation became possible, it seems likely that we had failed to identify this organism on many previous occasions. On the Difco medium, minimus colonies show no darkening and give little or no hint as to their true nature. The morphological picture is not typical of *Corynebacterium hoffmanni* but the usual fermentation pattern is that of Hoffmann's bacillus and the relative avirulence to guinea pigs would cause the unsuspecting bacteriologist to classify the organisms as Hoffmann's or a diphtheroid. If the above is true, and we believe it is, there must be a great deal of diphtheria missed from the laboratory standpoint, and this may account for some of the discrepancies between the laboratory and the clinician. If this organism is about to come into prominence, it appears desirable that bacteriologists should routinely employ a tellurite medium capable of assisting in the differentiation of the various types of *C. diphtheriae.* That this organism is probably very widely spread appears probable, as Frobisher (*4*) speaks of receiving four such strains from Leeds in 1936. He reports finding the minimus type in Baltimore in 1944, and we have found it in Utah in 1947.

CONCLUSIONS

Diphtheria increased in the State of Utah during the year 1947. *C. diphtheriae*, minimus type, was recognized a few weeks after the Division of Laboratories modified its tellurite medium so that type differentiation of the diphtheria bacillus was facilitated. The fact that this organism is capable of producing severe diphtheria in human beings, coupled with identification difficulties, presents a problem to public health laboratory workers which can be solved only by using one of the tellurite media capable of type differentiation.

REFERENCES

(*1*) Fraser, D. T.: A. P. H. A. Yearbook, 1936–37.
(*2*) Eller, C. Howe, and Frobisher, Martin, Jr.: An outbreak of diphtheria in Baltimore in 1944, Am. J. Hyg. **42:** 179 (1945).
(*3*) Frobisher, M., Jr., Adams, M. L., and Kuhns, W. J.: Characteristics of diphtheria bacilli found in Baltimore since Nov. 1942, Proc. Soc. Exp. Biol. and Med. **58:** 330 (1945).
(*4*) Frobisher, M., Jr.: A Note of the relationship between the intermedius and minimus type of *C. diphtheriae.* Proc. Soc. Exp. Biol. and Med. **62:** 304 (1946).

DEATHS DURING WEEK ENDED APR. 3, 1948

[From the Weekly Mortality Index, Issued by the National Office of Vital Statistics]

	Week ended Apr. 3, 1948	Corresponding week, 1947
Data for 91 large cities of the United States:		
Total deaths	9,616	10,093
Median for 3 prior years	9,034	
Total deaths, first 14 weeks of year	141,442	140,341
Deaths under 1 year of age	685	787
Median for 3 prior years	600	
Deaths under 1 year of age, first 14 weeks of year	9,620	11,236
Data from industrial insurance companies:		
Policies in force	71,109,393	67,321,203
Number of death claims	12,329	11,429
Death claims per 1,000 policies in force, annual rate	9.1	8.9
Death claims per 1,000 policies, first 14 weeks of year, annual rate	10.2	9.9

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED APRIL 10, 1948

Summary

Of the total of 37 cases of poliomyelitis reported for the current week Texas reported 9 (last week 5), New York and California 4 each, and Ohio and Iowa 3 each. No other State reported more than 2 cases. While the current total is above the corresponding figure for prior years (5-year median 22), and twice that for last week (18, the lowest weekly total recorded since May 1944), it is only 4 cases above the figure for the next earlier week. The total for the past 3 years (since the average date of seasonal low incidence) is 88, as compared with 77 for the same period last year, the latter number being the 5-year median for the period.

Of the current week's total of 2,702 cases of influenza (last week 3,658, 5-year median 2,148), only 3 States, all showing declines, reported more than 187 cases (Virginia 287, South Carolina 449, and Texas 1,104). The total for the year to date is 124,010, as compared with 242,601 for the same period last year and a 5-year median of 177,855.

For the current week, 2 cases of anthrax were reported (1 each in New York and New Jersey), 3 cases of smallpox (2 in Kansas and 1 in North Carolina), and 1 case of leprosy was reported in Texas.

For the year to date, figures above the corresponding medians have been reported for amebic and undefined dysentery (bacillary dysentery cases 3,516, 5-year median 3,991); Rocky Mountain spotted fever (6 cases to date, 5-year median 4); and undulant fever (1,269 cases to date, 3-year median 1,184).

A total of 9,663 deaths from all causes was recorded for the week in 92 large cities in the United States, as compared with 9,683 last week, 10,122 and 9,063, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 9,112. The cumulative total (15 weeks ended April 10) is 151,869, as compared with 151,189 for the corresponding period last year. Infant deaths for the week in the same cities totaled 713, as compared with 676 last week and a 3-year median of 596. The total to date is 10,391, as compared with 12,025 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Apr. 10, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47
	Apr. 10, 1948	Apr. 5, 1947		Apr. 10, 1948	Apr. 5, 1947		Apr. 10, 1948	Apr. 5, 1947		Apr. 10, 1948	Apr. 5, 1947	
NEW ENGLAND												
Maine	0	0	0	1	1	1	19	172	26	0	0	1
New Hampshire	0	0	0	------	1	------	------	37	26	0	0	0
Vermont	0	0	0	------	38	------	3	253	212	0	0	0
Massachusetts	2	13	6	------	------	------	1,332	390	643	0	3	5
Rhode Island	0	1	0	2	1	1	9	162	14	1	1	1
Connecticut	0	0	1	6	5	3	190	462	341	1	0	3
MIDDLE ATLANTIC												
New York	8	23	21	[1] 4	[1] 14	[1] 5	2,242	448	2,756	7	8	27
New Jersey	2	11	5	7	17	6	1,316	326	1,411	4	3	9
Pennsylvania	8	0	12	(2)	(2)	[2] 2	1,570	------	860	5	0	12
EAST NORTH CENTRAL												
Ohio	6	8	8	3	61	11	1,477	744	744	7	6	9
Indiana	6	11	7	------	21	19	782	57	226	0	1	4
Illinois	0	5	5	------	100	18	2,346	72	932	9	3	17
Michigan [3]	4	4	4	2	332	3	1,287	49	848	3	2	6
Wisconsin	2	9	3	16	282	40	1,953	382	1,627	1	2	4
WEST NORTH CENTRAL												
Minnesota	1	3	3	------	2	2	499	95	95	1	1	1
Iowa	0	0	2	------	3,842	------	755	251	235	2	1	2
Missouri	5	6	3	7	33	2	383	28	314	1	2	4
North Dakota	1	0	0	1	82	5	30	16	16	0	1	1
South Dakota	0	0	0	1	------	------	64	7	26	0	0	1
Nebraska	1	3	2	9	152	7	187	12	146	0	0	0
Kansas	1	5	4	1	1,634	4	55	10	566	0	3	5
SOUTH ATLANTIC												
Delaware	0	1	1	------	3	------	79	------	7	0	0	1
Maryland [3]	2	3	6	4	52	8	122	33	91	3	4	4
District of Columbia	0	0	0	------	------	------	123	18	57	2	0	1
Virginia	3	8	8	287	4,153	246	160	383	559	4	4	5
West Virginia	6	1	2	85	3,832	5	428	26	79	2	3	3
North Carolina	1	12	5	------	------	------	10	145	202	2	3	7
South Carolina	4	14	7	449	3,009	376	128	195	207	0	1	5
Georgia	4	2	2	22	502	15	63	212	177	0	0	2
Florida	0	7	3	3	142	2	183	89	89	1	2	4
EAST SOUTH CENTRAL												
Kentucky	6	11	6	------	------	3	128	17	112	2	3	4
Tennessee	5	7	5	70	1,276	57	260	106	252	4	1	5
Alabama	5	4	6	187	2,061	107	65	293	190	3	1	7
Mississippi [3]	1	4	4	12	435	------	75	25	------	2	1	5
WEST SOUTH CENTRAL												
Arkansas	1	5	4	98	3,167	50	156	103	153	0	0	2
Louisiana	0	8	3	7	19	18	4	47	170	1	3	3
Oklahoma	2	4	3	86	2,282	137	68	2	66	0	0	2
Texas	11	24	31	1,104	7,144	931	2,333	227	1,150	7	10	16
MOUNTAIN												
Montana	13	1	1	16	183	6	64	105	105	1	0	0
Idaho	0	0	1	10	184	2	25	6	28	0	0	0
Wyoming	0	0	0	------	16	1	166	12	58	0	0	0
Colorado	9	5	5	17	171	21	485	88	293	0	2	2
New Mexico	3	0	0	4	4	2	34	64	23	0	0	0
Arizona	1	4	4	108	196	83	275	47	60	0	0	0
Utah [3]	2	0	0	3	220	13	48	19	212	0	1	1
Nevada	0	0	0	------	------	------	------	------	1	0	0	0
PACIFIC												
Washington	4	4	3	1	52	2	440	53	349	0	1	3
Oregon	1	0	2	35	173	20	68	29	123	0	0	1
California	4	10	17	34	45	45	3,353	185	1,057	5	6	11
Total	135	241	219	2,702	35,939	2,148	25,842	6.502	25,377	81	83	191
14 weeks	2,860	4,001	4,001	124,010	242,601	177,855	225,048	75,568	235,785	1,200	1,200	3,423
Seasonal low week [4]	(27th) July 5-11			(30th) July 26-Aug. 1			(35th) Aug. 30-Sept. 5			(37th) Sept. 13-19		
Total since low	9,218	11,567	12,644	167,568	275,576	275,576	259,994	98,455	273,798	1,982	2,172	5,875

---

[1] New York City only.

[2] Philadelphia only.

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended Apr. 10, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever (streptococcal infections)			Smallpox			Typhoid and paratyphoid fever		
	Week ended— Apr. 10, 1948	Week ended— Apr. 5, 1947	Median 1943–47	Week ended— Apr. 10, 1948	Week ended— Apr. 5, 1947	Median 1943–47	Week ended— Apr. 10, 1948	Week ended— Apr. 5, 1947	Median 1943–47	Week ended— Apr. 10, 1948[5]	Week ended— Apr. 5, 1947	Median 1943–47
NEW ENGLAND												
Maine	0	0	0	16	19	24	0	0	0	0	0	0
New Hampshire	0	0	0	0	15	8	0	0	0	0	0	0
Vermont	0	0	0	3	7	11	0	0	0	3	0	0
Massachusetts	0	0	0	170	103	383	0	0	0	4	2	1
Rhode Island	0	0	0	5	15	21	0	0	0	0	0	0
Connecticut	0	0	0	33	53	82	0	0	0	0	1	1
MIDDLE ATLANTIC												
New York	4	3	3	183	402	667	0	0	0	1	2	3
New Jersey	0	0	0	72	130	176	0	0	0	0	1	1
Pennsylvania	2	1	1	265	0	482	0	0	0	0	0	2
EAST NORTH CENTRAL												
Ohio	3	0	0	279	381	409	0	2	0	1	2	2
Indiana	0	0	0	62	90	90	0	0	0	1	1	1
Illinois	0	3	2	144	111	180	0	0	0	3	2	2
Michigan[3]	2	1	0	144	140	159	0	0	0	1	1	2
Wisconsin	0	0	0	57	64	245	0	0	0	0	1	0
WEST NORTH CENTRAL												
Minnesota	0	0	0	50	30	76	0	0	0	0	0	0
Iowa	3	0	0	34	41	56	0	0	0	0	0	0
Missouri	0	1	0	25	51	80	0	0	0	4	1	1
North Dakota	0	0	0	4	10	10	0	0	0	0	0	0
South Dakota	0	0	0	6	13	17	0	0	0	0	0	0
Nebraska	2	0	0	12	30	53	0	0	0	3	0	0
Kansas	0	0	0	22	55	80	2	0	0	0	1	0
SOUTH ATLANTIC												
Delaware	0	0	0	5	9	9	0	0	0	0	0	0
Maryland[3]	0	0	0	22	33	174	0	0	0	0	0	0
District of Columbia	0	0	0	5	18	26	0	0	0	0	0	0
Virginia	1	0	0	24	34	97	0	0	0	2	2	2
West Virginia	0	0	0	25	13	27	0	0	0	1	2	2
North Carolina	2	0	0	11	30	41	1	0	0	3	0	0
South Carolina	1	0	1	3	7	5	0	0	0	0	0	0
Georgia	0	1	1	9	10	10	0	0	0	6	1	4
Florida	2	1	1	5	5	5	0	0	0	5	3	3
EAST SOUTH CENTRAL												
Kentucky	1	0	1	22	26	43	0	1	0	0	1	1
Tennessee	0	0	0	26	47	35	0	0	0	1	0	1
Alabama	0	0	1	4	28	17	0	0	0	1	1	1
Mississippi[3]	1	0	1	2	7	6	0	0	0	1	1	1
WEST SOUTH CENTRAL												
Arkansas	0	1	0	3	4	7	0	0	0	2	0	0
Louisiana	0	2	1	4	7	9	0	0	0	4	3	3
Oklahoma	0	0	0	10	2	14	0	0	0	3	0	0
Texas	9	3	2	44	27	76	0	0	0	10	3	6
MOUNTAIN												
Montana	0	0	0	10	7	12	0	0	0	0	0	0
Idaho	0	0	0	13	12	38	0	0	0	0	0	0
Wyoming	0	0	0	3	2	15	0	0	0	0	0	0
Colorado	0	0	0	21	46	50	0	0	0	0	0	0
New Mexico	0	0	0	4	6	6	0	0	0	0	0	1
Arizona	0	1	0	1	6	14	0	0	0	1	0	1
Utah[3]	0	0	0	13	21	35	0	0	0	0	0	0
Nevada	0	0	0	1	1	1	0	0	0	0	0	0
PACIFIC												
Washington	0	0	0	61	26	45	0	0	0	0	0	0
Oregon	0	0	0	14	21	30	0	0	0	1	1	2
California	4	4	2	77	139	180	0	0	0	3	6	4
Total	37	22	22	2,028	2,354	4,246	3	3	13	65	39	58
14 weeks	436	689	485	32,881	38,223	55,284	36	68	150	631	609	743
Seasonal low week[4]	(11th) Mar. 15–21			(32d) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar 15–21		
Total since low	88	77	77	55,420	64,909	93,605	57	118	233	158	124	158

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately, as follows: Vermont 2, Massachusetts 3 (salmonella infection), Michigan 1, North Carolina 1, Georgia 6, Alabama 1.

Telegraphic morbidity reports from State health officers for the week ended Apr. 10, 1948, and comparison with corresponding week of 1947 and 5-year median

Division and State	Whooping cough			Week ended Apr. 10, 1948							
	Week ended—		Median 1943–47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Apr. 10, 1948	Apr. 5, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	25	34	34	------	------	------	------	------	------	------	------
New Hampshire	------	3	3	------	------	------	------	------	------	------	------
Vermont	49	9	19	------	------	------	------	------	------	------	9
Massachusetts	48	109	109	------	4	------	------	------	------	------	1
Rhode Island	------	15	15	------	------	------	------	------	------	------	------
Connecticut	14	74	44	------	------	------	1	------	------	------	2
MIDDLE ATLANTIC											
New York	93	166	166	9	6	------	1	------	------	2	2
New Jersey	65	102	102	4	------	------	------	------	------	------	------
Pennsylvania	75	------	97	------	------	------	------	------	1	------	4
EAST NORTH CENTRAL											
Ohio	71	128	128	1	------	------	------	------	------	------	4
Indiana	58	15	10	------	------	------	------	------	------	------	------
Illinois	55	55	55	7	------	------	4	------	------	------	11
Michigan [3]	59	189	101	1	------	------	------	------	------	------	4
Wisconsin	79	126	97	------	------	------	------	------	------	------	3
WEST NORTH CENTRAL											
Minnesota	14	6	7	------	------	------	------	------	------	------	3
Iowa	6	6	6	------	------	------	1	------	------	------	------
Missouri	21	13	17	------	------	1	------	------	------	------	3
North Dakota	3	------	2	------	------	------	------	------	------	------	------
South Dakota	9	1	1	------	------	------	------	------	------	------	2
Nebraska	5	12	7	3	1	------	------	------	------	------	2
Kansas	45	9	31	------	------	------	------	------	------	------	------
SOUTH ATLANTIC											
Delaware	4	2	2	------	------	------	------	------	------	------	------
Maryland [3]	9	58	58	------	------	------	------	------	------	------	------
District of Columbia	5	5	6	------	------	------	------	------	------	------	------
Virginia	43	63	63	------	------	97	------	------	------	1	1
West Virginia	23	25	34	------	------	------	------	------	------	------	------
North Carolina	43	45	151	1	------	------	------	------	------	------	------
South Carolina	110	67	67	1	4	------	------	------	1	------	1
Georgia	15	13	16	------	------	------	------	------	2	------	2
Florida	18	51	19	------	------	------	------	------	------	1	1
EAST SOUTH CENTRAL											
Kentucky	15	18	18	------	3	------	------	------	------	------	------
Tennessee	21	28	28	7	------	1	------	------	1	------	7
Alabama	22	103	52	1	------	------	------	------	1	2	4
Mississippi [3]	3	15	------	7	------	------	------	------	4	1	2
WEST SOUTH CENTRAL											
Arkansas	37	19	9	2	------	2	------	------	1	------	------
Louisiana	4	8	3	2	------	------	------	------	------	------	------
Oklahoma	58	9	10	1	------	------	------	------	3	------	------
Texas	481	418	253	5	220	43	------	------	5	6	6
MOUNTAIN											
Montana	9	2	7	------	------	------	------	------	------	------	------
Idaho	9	13	2	------	------	------	------	------	------	------	------
Wyoming	------	------	1	------	------	------	------	------	------	------	------
Colorado	59	28	28	------	------	------	------	------	------	------	5
New Mexico	30	3	7	------	------	------	------	------	------	------	------
Arizona	54	23	24	------	------	13	------	------	------	------	------
Utah [3]	14	9	25	------	------	------	------	------	------	------	3
Nevada	------	1	------	------	------	------	------	------	------	------	------
PACIFIC											
Washington	29	56	34	------	------	------	------	------	------	------	2
Oregon	20	19	19	8	------	------	------	------	------	------	2
California	90	176	176	9	5	------	------	------	------	------	------
Total	2,019	2,349	2,349	69	243	157	7	0	19	13	86
Same week: 1947	2,349	------	------	28	158	176	1	0	21	17	93
Median, 1943–47	2,349	------	------	28	221	69	6	0	10	42	[6] 89
14 weeks: 1948	30,757	------	------	897	3,516	2,756	126	6	254	200	1,269
1947	35,487	------	------	655	4,425	3,025	93	12	494	578	1,465
Median, 1943–47	34,076	------	------	405	3,991	1,455	112	4	256	654	[6] 1,184

[3] Period ended earlier than Saturday.

[6] 3-year median 1945–47.

Anthrax: New York 1; New Jersey 1. *Leprosy:* Texas 1.

Alaska: Chickenpox 1, influenza 16, measles 1, whooping cough 8, pneumonia 10, scarlet fever 1, septic sore throat 1.

Territory of Hawaii: Rabies 0, bacillary dysentery 2, measles 2, scarlet fever 1, whooping cough 18, typhoid fever 1.

WEEKLY REPORTS FROM CITIES*

City reports for week ended Apr. 3, 1948

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	1	0	3	0	1	0	0	6
New Hampshire:												
Concord	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	5	0	------	1	333	2	12	0	34	0	1	10
Fall River	0	0	------	0	13	0	1	0	7	0	0	14
Springfield	0	0	------	0	1	0	1	0	0	0	0	1
Worcester	0	0	------	0	1	0	5	0	6	0	0	7
Rhode Island:												
Providence	0	0	------	0	------	0	1	0	16	0	0	------
Connecticut:												
Bridgeport	0	0	------	0	------	0	0	0	3	0	0	------
Hartford	0	0	------	0	3	0	0	0	2	0	0	------
New Haven	0	0	------	0	1	0	0	0	0	0	0	1
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	19	0	1	0	1	0	0	7
New York	7	0	7	0	1,699	3	72	0	102	0	2	36
Rochester	0	0	------	0	1	0	1	0	11	0	0	3
Syracuse	0	0	------	0	8	1	4	0	7	0	0	5
New Jersey:												
Camden	0	0	------	0	57	0	3	0	2	0	0	------
Newark	0	0	2	0	152	0	5	0	9	0	0	12
Trenton	0	0	2	0	4	0	1	0	1	0	0	------
Pennsylvania:												
Philadelphia	3	1	4	1	714	2	31	0	36	0	0	15
Pittsburgh	0	0	2	1	1	1	9	0	25	0	0	11
Reading	0	0	------	0	7	0	2	0	7	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	1	0	------	0	43	2	13	0	14	0	0	3
Cleveland	1	0	------	0	22	0	8	0	25	0	0	8
Columbus	1	0	------	0	102	0	2	0	0	0	0	------
Indiana:												
Fort Wayne	0	0	------	0	19	0	1	0	5	0	0	------
Indianapolis	1	0	------	0	176	0	2	0	9	0	0	11
South Bend	0	0	------	0	2	0	0	0	0	0	0	------
Terre Haute	1	0	------	0	3	0	2	0	1	0	0	1
Illinois:												
Chicago	1	0	2	0	961	2	27	0	48	0	0	22
Springfield	0	0	------	0	74	0	4	0	7	0	0	------
Michigan:												
Detroit	2	0	1	2	298	1	11	0	49	0	0	19
Flint	0	0	------	0	------	0	3	0	3	0	0	------
Grand Rapids	0	0	------	1	85	0	2	0	2	0	0	4
Wisconsin:												
Kenosha	0	0	------	0	95	0	0	0	0	0	0	------
Milwaukee	0	0	------	0	39	1	2	0	19	0	0	5
Racine	0	0	------	0	194	1	1	1	2	0	0	1
Superior	0	0	------	0	266	0	0	0	0	0	0	------
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	146	0	1	0	3	0	0	------
Minneapolis	1	0	------	0	63	1	0	0	7	0	0	9
St. Paul	0	0	------	0	59	0	1	0	0	0	0	1
Missouri:												
Kansas City	0	0	------	1	43	0	6	0	2	0	1	5
St. Joseph	0	0	------	0	------	0	0	0	0	0	0	------
St. Louis	3	1	1	0	269	2	13	0	13	0	0	3

*In some instances the figures include nonresident cases.

City reports for week ended Apr. 3, 1948—Continued

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	0	135	0	3	0	0	0	0	1
Kansas:												
Topeka	0	0	------	0	24	0	2	0	1	0	0	2
Wichita	0	0	------	0	2	0	2	0	1	0	0	9
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	34	0	2	0	0	0	0	------
Maryland:												
Baltimore	3	0	1	1	49	0	5	0	4	0	0	6
Cumberland	0	0	------	0	------	0	0	0	1	0	0	------
Frederick	0	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	122	0	10	0	5	0	1	1
Virginia:												
Lynchburg	1	0	------	0	------	0	1	0	0	0	0	3
Richmond	0	0	------	0	------	0	4	0	1	0	0	3
Roanoke	0	0	------	0	2	0	0	0	2	0	0	------
West Virginia:												
Charleston	0	0	------	0	3	0	2	0	0	0	0	------
Wheeling	0	0	------	0	19	0	3	0	1	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	0	3	0	1	0	0	------
Wilmington	0	0	------	0	------	0	0	0	0	0	0	4
Winston-Salem	0	0	------	0	------	0	2	0	0	0	0	------
South Carolina:												
Charleston	1	0	63	0	4	0	3	0	1	0	0	6
Georgia:												
Atlanta	1	0	------	0	------	1	1	0	6	0	0	1
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Savannah	0	0	3	3	1	0	0	0	0	0	0	------
Florida:												
Tampa	2	0	1	1	19	0	2	0	0	0	0	1
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	191	0	6	0	1	0	0	2
Nashville	1	0	------	0	1	1	2	0	2	0	0	2
Alabama:												
Birmingham	0	0	1	0	1	0	1	0	0	0	0	------
Mobile	0	0	------	0	------	1	0	0	1	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	5	0	4	0	2	0	1	0	0	------
Louisiana:												
New Orleans	0	0	5	0	4	0	1	0	3	0	0	6
Shreveport	0	0	------	0	------	0	6	0	0	0	0	------
Oklahoma:												
Oklahoma City	0	0	35	0	2	0	2	0	0	0	0	3
Texas:												
Dallas	0	0	------	0	142	0	6	0	7	0	0	6
Galveston	0	0	------	0	1	0	0	0	0	0	0	------
Houston	1	0	------	0	3	0	6	1	4	0	0	5
San Antonio	0	0	------	0	7	0	10	0	2	0	0	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	------	0	2	0	1	0	0	------
Great Falls	0	0	------	0	6	0	1	1	1	0	0	1
Helena	0	0	------	0	------	0	0	0	0	0	0	------
Missoula	0	0	------	0	------	0	0	0	1	0	0	------
Idaho:												
Boise	0	0	------		------	0	1	0	0	0	0	------
Colorado:												
Denver	1	0	1	0	566	0	0	0	5	0	0	12
Pueblo	0	0	------	0	19	0	1	0	2	0	0	3
Utah:												
Salt Lake City	0	0	------	0	17	0	2	0	1	0	0	1

City reports for week ended Apr. 3, 1948—Continued

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	1	0	------	0	49	0	5	0	8	0	0	10
Spokane	0	0	------	0	3	0	2	0	0	0	0	1
Tacoma	0	0	------	0	38	0	0	0	5	0	0	------
California:												
Los Angeles	3	0	12	1	290	0	5	0	20	0	0	7
Sacramento	0	0	------	0	7	0	1	0	1	0	0	4
San Francisco	4	0	4	1	264	0	8	0	9	0	0	4
Total	46	2	152	14	8,003	22	366	2	578	0	5	326
Corresponding week, 1947 [1]	73	------	955	63	1,547	------	553	------	797	0	12	559
Average 1943-47 [1]	70	------	238	[2] 33	[3] 7,056	------	[2] 420	------	1,601	1	11	635

[1] Exclusive of Oklahoma City.
[2] 3-year average, 1945-47.
[3] 5-year median, 1943-47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (latest available estimated population, 34,593,800)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Tyhpoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	13.1	0.0	0.0	2.6	927	5.3	60.4	0.0	181	0.0	2.6	102
Middle Atlantic	4.6	0.5	7.9	0.9	1,232	3.2	59.7	0.0	93	0.0	0.9	42
East North Central	4.9	0.0	1.8	1.8	1,447	4.3	47.4	0.6	112	0.0	0.0	45
West North Central	8.0	2.0	2.0	2.0	1,490	6.0	56.3	0.0	54	0.0	2.0	60
South Atlantic	13.1	0.0	111.1	8.2	414	1.6	62.1	0.0	36	0.0	1.6	41
East South Central	5.9	0.0	5.9	0.0	1,139	11.8	53.1	0.0	24	0.0	0.0	24
West South Central	2.5	0.0	114.3	0.0	414	0.0	83.8	0.0	43	0.0	0.0	53
Mountain	7.9	0.0	7.9	0.0	4,829	0.0	55.6	7.9	87	0.0	0.0	135
Pacific	12.7	0.0	25.3	3.2	1,030	0.0	33.2	0.0	68	0.0	0.0	41
Total	7.0	0.3	23.0	2.1	1,210	3.3	55.3	0.3	87	0.0	0.8	49

Dysentery, amebic.—Cases: New York, 10; St. Louis, 2; New Orleans, 3; Los Angeles, 3; San Francisco, 1.
Dysentery, bacillary.—Cases: New York, 1; Los Angeles, 1.
Dysentery, unspecified.—Cases: Baltimore, 1; San Antonio, 3.
Tularemia.—Cases: Memphis, 2.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—Two rats found dead in the Hamakua District, Island of Hawaii, T. H., one on January 9, 1948, the other on January 21, 1948, have proved positive for plague.

FOREIGN REPORTS

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From consular reports, international health organizations, medical officers of the Public Health Service, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January-December 1947	January-February 1948	March 1948—week ended—			
				6	13	20	27
AFRICA							
Egypt	C	21,920	1				
Alexandria	C	253					
Cairo	C	140	1				
Ismailiya	C	111					
Port Said	C	37					
Suez	C	26					
ASIA							
Arabia: Amirate of Dubay	C	1					
Burma	C	263	1				
Moulmein	C	66					
Rangoon	C	4					
China:							
Anhwei Province	C	6					
Chekiang Province	C	288					
Pingyang	C	150					
Wenchow	C	1					
Formosa (Island of)	C	14					
Fukien Province	C	16					
Foochow	C	2					
Honan Province	C	936					
Hunan Province	C	16					
Kiangsi Province	C	102					
Kiangsu Province	C	738					
Chinkiang	C	8					
Shanghai	C	53					
Tsingkiang	C	9					
Kwangtung Province	C	6					
Hong Kong	C	6					
Suiyuan Province	C	52					
Szechwan Province	C	5					
India	C	151,248	18,243				
Ahmadabad	C	27	1			1	
Allahabad	C	70					
Alleppey	C		1				
Bombay	C	114					
Calcutta	C	4,716	1,326	158	208	182	306
Cawnpore	C	332			3	3	8
Chittagong (See also Pakistan)	C	32					
Cocanada	C		2				
Cuddalore	C	4	12				
Kilakarai	C		7	3	3		
Lahore (See also Pakistan)	C	2,173					
Lucknow	C	288	6	2	1		
Madras	C	27	7	3	3	4	1
Nagpur	C	38				1	
Negapatam	C	19	13	1	1	1	
New Delhi	C	35					
Tuticorin	C	13	14	1	1		
Vizagapatam	C	5					
India (French):							
Chandernagor	C	39	12				
Karikal	C	155	284				
Pondicherry	C	42	26				
India (Portuguese)	C	51					

CHOLERA—Continued

Place		January-December 1947	January-February 1948	March 1948—week ended— 6	13	20	27
ASIA—continued							
Indochina (French):							
Annam	C	37	-------	-------	-------	-------	-------
Cambodia	C	1,173	611	-------	[1] 76	[2] 56	-------
Cochinchina	C	541	54	-------	[1] 41	[2] 38	-------
Bien Hoa	C	7	-------	-------	-------	-------	-------
Chaudoc	C	5	1	-------	-------	-------	-------
Cholon	C	33	1	-------	-------	-------	-------
Giadinh	C	11	-------	-------	-------	-------	-------
Longxuyen	C	36	-------	-------	[1] 5	-------	-------
Mytho	C	6	4	-------	-------	-------	-------
Rachgia	C	22	11	-------	[1] 32	-------	-------
Saigon	C	136	11	2	2	2	6
Vinh-long	C	8	-------	-------	-------	-------	-------
Laos	C	55	[3] 12	-------	-------	-------	-------
Tonkin	C	67	-------	-------	-------	-------	-------
Pakistan	C	-------	5,436	-------	-------	-------	-------
Chittagong	C	-------	5	1	6	4	-------
Lahore	C	-------	-------	-------	13	2	-------
Siam (Thailand)	C	3,451	24	-------	1	-------	-------
Bangkok	C	789	-------	-------	-------	-------	-------
Straits Settlements: Penang	C	[4] 1	-------	-------	-------	-------	-------
Syria	C	45	3	-------	-------	-------	-------

[1] For the period Mar. 1-10, 1948.
[2] For the period Mar. 11-20, 1948.
[3] Deaths.
[4] Imported.

PLAGUE

[C indicates cases; D, deaths]

AFRICA							
Belgian Congo	C	[1] 21	2	-------	-------	1	-------
British East Africa:							
Kenya	C	60	8	3	1	-------	-------
Tanganyika	C	-------	11	40	-------	-------	-------
Uganda	C	1	-------	-------	-------	-------	-------
Egypt: Alexandria	C	24	-------	-------	-------	-------	-------
Madagascar	C	[2] 276	107	[3] 11	1	-------	-------
Mananjary	C	8	-------	-------	-------	-------	-------
Tananarive	C	48	-------	-------	1	-------	-------
Rhodesia, Northern	C	-------	5	8	-------	-------	-------
Union of South Africa	C	[4] 42	[5] 28	3	[5] 4	-------	-------
ASIA							
Burma	C	1,362	296	30	35	26	15
Bassein	C	[6] 2	-------	-------	-------	-------	-------
Mandalay	C	17	5	1	-------	-------	-------
Rangoon	C	19	[7] 10	-------	1	-------	-------
China:							
Chekiang Province	C	150	-------	-------	-------	-------	-------
Wenchow	C	14	-------	1	-------	-------	-------
Formosa (Island of)	C	1	-------	-------	-------	-------	-------
Fukien Province	C	779	22	-------	-------	-------	-------
Amoy	C	13	-------	-------	-------	-------	-------
Foochow	C	49	-------	-------	-------	-------	-------
Kiangsi Province	C	454	8	-------	-------	-------	-------
Nanchang	C	46	-------	-------	-------	-------	-------
Kiangsu Province	C	30	-------	-------	-------	-------	-------
Shanghai	C	28	-------	-------	-------	-------	-------
Kwangtung Province	C	164	-------	-------	-------	-------	-------
Yunnan Province	C	[8] 791	20	-------	-------	-------	-------
India	C	75,647	8,432	-------	-------	-------	-------
Indochina (French):							
Annam	C	89	106	-------	[3] 10	[9] 11	-------
Cambodia	C	1	-------	-------	-------	-------	-------
Cochinchina	C	31	9	-------	[3] 1	-------	-------
Laos State	C	2	-------	-------	-------	[9] 1	[10] 1
Java	C	39	4	-------	-------	-------	-------
Korea	C	22	-------	-------	-------	-------	-------
Manchuria	D	[11] 100	-------	-------	-------	-------	-------
Palestine	C	43	-------	-------	-------	-------	-------
Siam (Thailand)	C	67	88	3	1	-------	1
Syria	C	6	-------	-------	-------	-------	-------
Turkey: Akcakale	C	19	-------	-------	-------	-------	-------
EUROPE							
Germany: East Prussia.[12]							
Portugal: Azores	C	6	4	-------	-------	-------	-------
Turkey (see Turkey in Asia).							

See footnotes at end of table.

PLAGUE—Continued

Place		January-December 1947	January-February 1948	March 1948—week ended— 6	13	20	27
NORTH AMERICA							
Canada.[13]							
SOUTH AMERICA							
Argentina:							
Buenos Aires Province	C		5				
Cordoba Province	C	1					
Santa Fe Province	C	3					
Brazil: [14]							
Alagoas State	C	2					
Bahia State	C	1					
Ceara State	C	2					
Minas Geraes State	C	7					
Parahyba State	C	4					
Pernambuco State	C	16					
Ecuador:							
Chimborazo Province	C	5	1				
Loja Province	C	22	1				
Peru:							
Ancash Department	C	1					
Huacho Department	C		1				
Lambayeque Department	C	11					
Libertad Department	C	20					
Lima Department	C	56	5				
Piura Department	C	[15] 79					
OCEANIA							
Hawaii Territory: Plague-infected rats [16]		[17] 8	[17, 18] 4				

---

[1] Includes 5 cases of pneumonic plague.
[2] Includes 78 cases of pneumonic plague.
[3] For the period Mar. 1-10, 1948.
[4] Includes 4 cases of pneumonic plague.
[5] Includes 2 cases of pneumonic plague.
[6] Imported.
[7] Includes 2 imported cases.
[8] Includes 12 cases of pneumonic plague.
[9] For the period Mar. 11-20, 1948.
[10] For the period Mar. 21-31, 1948.
[11] Period not specified.
[12] During the month of June 1947, an outbreak of plague with high mortality occurred in Königsberg, East Prussia, Germany.
[13] For the period July 5 to Sept. 20, 1947, 6 lots of plague-infected fleas from squirrels were reported in Alberta and Saskatchewan Provinces, Canada.
[14] In addition, 7 cases of plague were reported in Brazil for the period Jan. 1 to May 31, 1947, specific localities not being given.
[15] In addition 82 cases with 65 deaths in Ayabaca Province and 58 cases with 48 deaths in Huancabamba Province, all unconfirmed, were reported for the period September 1946 to March 1947.
[16] Plague infection was also reported in Hawaii Territory as follows: On Jan. 9, 1947, in a pool of 31 rats, on Mar. 20, 1947, in a pool of 32 fleas collected from 59 rats; under date of Feb. 27, 1948, in a mass inoculation of tissue from 19 rats.
[17] Re-allocation of dates.
[18] Includes 1 mouse.

SMALLPOX

[C indicates cases; P, present]

AFRICA							
Algeria	C	287	72		[1] 12		
Angola	C	282					
Basutoland	C	1	3				
Bechuanaland	C	38					
Belgian Congo	C	[2] 2,605	[2] 387	[2] 101	[2] 46		[2] 13
British East Africa:							
Kenya	C	471	48				
Nyasaland	C	2,198	831	56	80	75	
Tanganyika	C	2,806	82				
Uganda	C	614	81				
Cameroon (French)	C	139			[1] 1		
Dahomey	C	161	76		[1] 54	[3] 31	[4] 21
Egypt	C	496	82	39	29		
Ethiopia	C	32					
French Equatorial Africa	C	12	10				
French Guinea	C	427	48		[1] 5		
French West Africa: Haute-Volta	C		245		[1] 6	[3] 22	
Gambia	C	6	15	1			

See footnotes at end of table.

SMALLPOX—Continued

Place		January-December 1947	January-February 1948	March 1948—week ended—			
				6	13	20	27
AFRICA—continued							
Gold Coast	C	969	283	--------	--------	--------	--------
Ivory Coast	C	2,913	164	--------	[1] 13	[3] 10	--------
Liberia	C	37	--------	--------	--------	--------	--------
Libya	C	2,312	54	4	4	--------	3
Mauritania	C	23	1	--------	--------	--------	--------
Morocco (French)	C	61	11	--------	--------	--------	--------
Morocco (Int. Zone)	C	12	--------	--------	--------	--------	--------
Morocco (Spanish)	C	30	--------	--------	--------	--------	--------
Mozambique	C	28	17	--------	--------	--------	--------
Nigeria	C	5,238	316	--------	--------	--------	--------
Niger Territory	C	2,685	147	--------	[1] 16	--------	--------
Portuguese Guinea	C	3	--------	--------	--------	--------	--------
Rhodesia:							
Northern	C	171	103	3	--------	--------	--------
Southern	C	557	--------	--------	--------	--------	--------
Senegal	C	17	3	--------	--------	--------	--------
Sierra Leone	C	422	74	--------	--------	--------	--------
Sudan (Anglo-Egyptian)	C	[2] 940	[2] 291	[2] 19	[2] 22	[2] 24	--------
Sudan (French)	C	395	8	--------	[1] 2	[3] 1	--------
Swaziland	C	11	--------	--------	--------	--------	--------
Togo (French)	C	88	12	--------	[1] 11	[3] 4	--------
Tunisia	C	1,192	399	--------	[1] 29	--------	--------
Union of South Africa	C	538	P	P	P	--------	--------
ASIA							
Arabia	C	1	--------	--------	--------	--------	--------
British North Borneo	C	--------	1	--------	--------	--------	--------
Burma	C	2,880	682	131	137	149	--------
Ceylon	C	1	--------	--------	[5] 6	--------	--------
China	C	3,442	1,436	89	153	186	110
India	C	53,800	15,108	2,215	2,178	1,163	385
India (French)	C	10	--------	--------	--------	--------	--------
India (Portuguese)	C	12	--------	--------	--------	--------	--------
Indochina (French)	C	4,905	1,024	--------	[1] 138	[3] 247	--------
Iran	C	408	287	17	--------	15	--------
Iraq	C	67	174	52	43	44	37
Japan	C	391	6	--------	--------	--------	--------
Korea	C	125	--------	--------	--------	--------	--------
Lebanon	C	22	57	--------	--------	--------	--------
Malay States (Federated)	C	4,160	264	--------	--------	--------	--------
Manchuria	C	8	30	--------	--------	--------	--------
Netherlands East Indies	C	4	--------	--------	--------	--------	--------
Pakistan	C	--------	4,240	--------	--------	--------	--------
Palestine	C	--------	8	--------	--------	--------	--------
Portuguese Timor	C	32	--------	--------	--------	--------	--------
Siam (Thailand)	C	1,369	304	11	32	--------	7
Straits Settlements	C	99	--------	--------	--------	--------	--------
Syria	C	27	15	--------	--------	14	--------
Turkey. (See Turkey in Europe.)							
EUROPE							
Belgium	C	[2] 23	--------	--------	--------	--------	--------
France	C	48	--------	--------	[1] 2	--------	--------
Germany	C	12	--------	--------	--------	--------	--------
Great Britain: England and Wales	C	77	--------	--------	--------	--------	--------
Greece	C	10	--------	--------	--------	--------	--------
Irish Free State	C	[5] 1	--------	--------	--------	--------	--------
Italy	C	68	--------	--------	--------	--------	--------
Luxemburg	C	[2] 3	--------	--------	--------	--------	--------
Portugal	C	220	26	2	--------	--------	--------
Spain	C	32	17	--------	--------	--------	--------
Canary Islands	C	--------	9	--------	--------	--------	--------
Switzerland	C	[5] 1	--------	--------	--------	--------	--------
Turkey	C	3	--------	--------	--------	--------	--------
NORTH AMERICA							
Guatemala	C	12	1	--------	--------	--------	--------
Honduras	C	2	--------	--------	--------	--------	--------
Mexico	C	1,133	138	--------	--------	--------	--------
Panama (Republic)	C	[5] 1	--------	--------	--------	--------	--------
SOUTH AMERICA							
Argentina	C	46	--------	--------	--------	--------	--------
Bolivia	C	--------	16	--------	--------	--------	--------
Brazil	C	571	--------	--------	--------	--------	--------
Chile	C	--------	--------	--------	3	--------	--------
Colombia	C	3,989	1,018	--------	39	33	--------
Ecuador	C	[2] 3,003	[3] 1,083	--------	--------	--------	--------

See footnotes at end of table.

SMALLPOX—Continued

Place		January-December 1947	January-February 1948	March 1948—week ended—			
				6	13	20	27
SOUTH AMERICA—continued							
Paraguay	C	[2] 1,797	[2] 49				
Peru	C	457				[6] 20	
Uruguay	C	[2] 319					
Venezuela	C	[2] 5,365	[2] 886	[2] 173	[2] 73	[2] 25	

[1] For the period Mar. 1-10, 1948.
[2] Includes alastrim.
[3] For the period Mar. 11-20, 1948.
[4] For the period Mar. 21-31, 1948.
[5] Imported.
[6] For the period Mar. 1-15, 1948.

TYPHUS FEVER*

[C indicates cases; P, present]

AFRICA							
Algeria	C	257	54		[1] 16		
Basutoland	C	15	2				
Bechuanaland	C	1					
Belgian Congo	C	393	43	4	5		
British East Africa:							
Kenya [2]	C	32	11				
Uganda	C	2					
Egypt	C	138	23	3			
Eritrea	C	747	13				
Ethiopia	C	360					
French West Africa [3]	C	2					
Gold Coast	C	6					
Libya	C	333	46	9	2	6	11
Morocco (French)	C	128	22		[1] 8	[4] 10	
Morocco (International Zone)	C	27					
Morocco (Spanish)	C	88					
Nigeria [2]	C	18	2				
Rhodesia:							
Northern	C	1					
Southern	C	1					
Senegal	C	2					
Sierra Leone	C	3	[3] 1				
Sudan (Anglo-Egyptian)	C	1					
Tunisia [2]	C	694	112		[1] 39		
Union of South Africa [2]	C	443	P	P	P		
ASIA							
Arabia [3]	C	2					
Burma	C	3	5				
Ceylon	C	4					
China [2] [5]	C	105	33	1			
India	C	8					
Indochina (French)	C	79	3		[1] 1		
Iran	C	263	41	3			
Iraq	C	305	32		2	8	9
Japan	C	1,115	182		2		
Java	C	1					
Korea	C	1,261					
Malay States (Federated) [2]	C	50					
Manchuria	C	12	5				
Palestine [2]	C	238	12				
Siam (Thailand)	C	4					
Straits Settlement [2]	C	11	1	1			
Syria [2]	C	33	2	10		1	
Trans-Jordan	C	20	18	1			
Turkey (see Turkey in Europe)							
EUROPE							
Austria [3]	C	8					
Bulgaria	C	879	91	23	37		
Czechoslovakia	C	44	1	1			
France	C	4					
Germany	C	27	4				
Great Britain: Malta and Gozo [2]	C	25	7	1			
Greece [2]	C	396	35			6	6
Hungary	C	607	22	5	1	2	
Italy	C	76	9				
Sicily	C	39					
Luxemburg [2]	C	5	10	2			
Netherlands [2]	C	3	1				
Norway [3]	C	1					
Poland	C	542	53				
Portugal	C	4					

See footnotes at end of table.

TYPHUS FEVER—Continued

Place		January-December 1947	January-February 1948	March 1948—week ended—			
				6	13	20	27
EUROPE—continued							
Rumania [2]	C	34, 624	12, 209				
Spain	C	188					
Switzerland [3]	C	6					
Turkey	C	665	117	11	12	6	6
Yugoslavia	C	215	107	22	38	27	
NORTH AMERICA							
Costa Rica [3]	C	102	1				
Cuba [3]	C	11	4				
Guatemala	C	399	18				
Jamaica [3]	C	42	2				
Mexico	C	2, 135	220	10	4		12
Nicaragua	C	2					
Panama Canal Zone	C	15	1				
Panama (Republic)	C	[6] 24					
Puerto Rico [3]	C	57	5	1	1		
Virgin Islands [3]	C	2					
SOUTH AMERICA							
Argentina [2]	C	18					
Bolivia	C			3			
Brazil	C	86	56	5	1		
Chile [3]	C	538	10	1	1		
Colombia	C	2, 354	561				
Curacao [3]	C	1	4				
Ecuador [3]	C	606	92				
Peru	C	1, 527					
Venezuela [2]	C	193	13		2		
OCEANIA							
Australia [3]	C	172	26	2			
Hawaii Territory [3]	C	46					

*Reports from some areas are probably murine type, while others probably include both murine and louse-borne types.

[1] For the period Mar. 1–10, 1948.

[2] Includes murine type.

[3] Murine type.

[4] For the period Mar. 11–20, 1948.

[5] Information dated Dec. 10, 1947, stated that 100 deaths from typhus fever daily had occurred in Sinkiang Province, China, and spreading in Tihwa.

[6] Includes imported cases.

YELLOW FEVER

[C indicates cases; D, deaths]

AFRICA							
Belgian Congo: Orientale Province [1]	C	1					
Ivory Coast	C				1		
Nigeria:							
Ossiomo Leper Settlement	C	[2] 1					
Lagos Island	C			[2] 1			
Sudan (French): Bamako	C	3					
SOUTH AMERICA							
Brazil:							
Bahia State	D	1					
Para State	D	1					
Colombia:							
Antioquia Department	C	[3] 8	[3] 5				
Boyaca Department	D	4	1				
Caldas Department	D	9	2				
Cundinamarca Department	D	2	7				
Intendencia of Meta	D	10	3				
North Santander Department	D	1					
Santander Department	D	29					
Tolima Department	D	3					
Peru: Huanuco Department	D	3					

---

[1] The case of yellow fever in Orientale Province, Belgian Congo, reported on p. 232 of the PUBLIC HEALTH REPORTS for Feb. 13, 1948, and also on p. 296 of the PUBLIC HEALTH REPORTS for Feb. 27, 1948, in the column for week ended Jan. 17, has not been confirmed.

[2] Suspected.

[3] Includes deaths used as cases.

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948

For sale by the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C

Price 10 cents. Subscription price $4.00 a year

Public Health Reports

VOLUME 63 MAY 7, 1948 NUMBER 19

TUBERCULOSIS CONTROL ISSUE NO. 27

IN THIS ISSUE

Editorial—Further Study of BCG Vaccination

Studies of Fungus Antigens III

Isolation of Fungi From Inoculated Guinea Pigs

Expert Committee on Tuberculosis

Incidence of Communicable Diseases in the U. S.

1798

FEDERAL SECURITY AGENCY

PUBLIC HEALTH SERVICE

FEDERAL SECURITY AGENCY

OSCAR R. EWING, *Adminisrrator*

PUBLIC HEALTH SERVICE

LEONARD A. SCHEELE, *Surgeon General*

DIVISION ON PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

CONTENTS*

Page

Editorial—Further study of BCG vaccination. Francis J. Weber 593

Studies of fungus antigens. III. Sensitization of normal animals with skin test antigens. Arden Howell, Jr 595

Isolation of pathogenic fungi from experimentally inoculated guinea pigs. Arden Howell, Jr 602

Expert committee on tuberculosis. Report of the first session 616

Incidence of Communicable Diseases in the United States 623

INCIDENCE OF DISEASE

United States:
- Reports from States for week ended April 17, 1948, and comparison with former years 626
- Weekly reports from cities:
- City reports for week ended April 10, 1948 630
- Rates, by geographic divisions, for a group of selected cities 632
- Territories and possessions:
  - Panama Canal Zone—Notifiable diseases—February 1948 633

Deaths during week ended April 10, 1948 633

Foreign reports:
- Canada—Provinces—Communicable diseases—Weeks ended March 20 and 27, 1948 634
- Madagascar and Comoro Islands—Contagious diseases—January and February 1948 635
- Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—
  - Cholera 635
  - Plague 635
  - Smallpox 636

---

*This is the twenty-seventh of a series of special issues of PUBLIC HEALTH REPORTS devoted exclusively to tuberculosis control, which will appear the first week of each month. The series began with the Mar. 1, 1946 issue. The articles in these special issues are reprinted as extracts from the PUBLIC HEALTH REPORTS. Effective with the July 5, 1946, issue, these extracts may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 10 cents a single copy. Subscriptions are obtainable at $1.00 per year; $1.25 foreign.

Public Health Reports

Vol. 63 • MAY 7, 1948 • *No. 19*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

EDITORIAL

FURTHER STUDY OF BCG VACCINATION

At the 1946 conference on BCG vaccination, held in Washington in September of that year, certain recommendations were made which were reported in the March 7, 1947, issue of PUBLIC HEALTH REPORTS. Since that time, nation-wide interest in this immunizing procedure has grown to an unprecedented level of intensity. So great, indeed, had been the demand from every quarter for additional information concerning the course of BCG investigations that an evaluation and review of recent work in the field had become increasingly appropriate. To that end, a second conference convened in New York City on March 9, 1948, attended by the same group which had met in 1946 to formulate the original policy.

In considering the present status of BCG, the New York conference recognized that many fundamental problems are yet to be resolved concerning the vaccination technique and the vaccine itself. Accordingly, the committee of specialists recommended that the entire problem of BCG continue to receive further attention in the form of intensified research and critical study, and that its application in this country be restricted to certain groups and circumstances.

The decision to limit the use of BCG for the present would appear to be wholly sound and practical. In certain other diseases, such as smallpox, where the desirability of vaccination procedures has been so clearly established, it would be difficult, indeed, to conceive of control without the practice of immunization. In tuberculosis, however, where our fund of knowledge regarding immunization is as yet incomplete, vaccination must continue to be carried out under appropriate safeguards.

The results of careful study leave little doubt that BCG is harmless. As for the degree of immunity which the agent confers, however, there has been very little unanimity of opinion. Although it has become increasingly evident that properly administered BCG vaccination does increase individual resistance to tuberculous infection, there is still a singular lack of definitive information concerning the exact duration of the protection bestowed by the agent. The reason for this is simply that to date, there has been no reliable study of sufficient duration to permit precise evaluation of the vaccine's effectiveness over long periods of time.

Should further study demonstrate that BCG vaccination confers only short-term protection, this would not necessarily argue against its use. In such an eventuality, revaccination might serve to reestablish temporary protection, as is sometimes necessary in the case of other immunizing agents when the immunity conferred by such agents wanes with the passage of time. It can be reasonably expected that further research will provide solutions to these and other problems now confronting BCG investigators.

Regardless of the ultimate place of this immunizing agent in the nation's tuberculosis control program, however, it is extremely unlikely that BCG will ever obviate entirely the necessity for the conscientious prosecution of proved control measures. These must be exploited to the fullest in order to secure past gains and to meet extant needs. Indeed, there is a considerable body of opinion in this country which holds that modern methods of diagnosis and treatment make possible the effective control of the disease without resort to vaccination procedures, especially in areas of low prevalence which possess adequate diagnostic and medical-care facilities. In such locales, the widespread use of BCG could be expected to make relatively little contribution to the control of the disease at this time. In some respects, indeed, it might serve only to confuse existing epidemiological patterns, particularly with reference to the alteration of tuberculin sensitivity. From this point of view, one can appreciate the concern expressed in some quarters that the present balance of tuberculosis control may be disturbed or possibly dislocated by the unqualified acceptance of an insufficiently tried alternative to present control measures.

Therefore, until all the problems of BCG vaccination as a tuberculosis control technique are resolved, and until we can be certain of the implications of a change in emphasis at this time, we have no right to relax our efforts in the application of measures which long experience has shown to be eminently practical and profitable. To do so prematurely might conceivably prove wasteful, if not disastrous, for when incompletely proved techniques are hastily adopted, it frequently happens that "those who cannot remember the past are condemned to repeat it." True progress lies not in that direction.

FRANCIS J. WEBER, *Medical Director,*
Chief, Tuberculosis Control Division.

STUDIES OF FUNGUS ANTIGENS. III.

Sensitization of Normal Animals With Skin Test Antigens[1]

By ARDEN HOWELL, Jr., *Ph. D., Senior Mycologist, Public Health Service*

INTRODUCTION

It has been shown (*1, 2*) that repeated intradermal injections of 0.1 ml. of 1–10 and 1–100 dilutions of each of several lots of histoplasmin and blastomycin into normal guinea pigs does not sensitize these animals. It has also been shown that coccidioidin (*3*) and other skin test antigens (*4, 5, 6*), injected subcutaneously or intraperitoneally, may sensitize guinea pigs. The following experiment was undertaken, therefore, to determine the effects of repeated intradermal injections of more concentrated dilutions of histoplasmin, blastomycin, and other fungus antigens on normal guinea pigs.

MATERIALS AND METHODS

Each of 20 normal albino guinea pigs was tested simultaneously with a skin test dose (0.1 ml.) of undiluted histoplasmin, a 1–10, and a 1–100 dilution of histoplasmin, lots H–15 and H–6 (*2*). At the same time, 10 of these were tested with similar doses of a 1–100 dilution of a heat-killed yeast-phase antigen of *Histoplasma capsulatum* (*2*); the other 10 with a 1–10 dilution of this antigen. After 35 days, 19 of these animals were retested with the same amount of the same 3 dilutions of histoplasmin, lot H–15, and with a 1–100 dilution of the yeast-phase antigen. At intervals thereafter, the animals were retested with a 1–100 dilution of lot H–15 histoplasmin.

A second group of 10 normal albino guinea pigs were tested simultaneously with 0.1 ml. of undiluted, 1–10, and 1–100 dilutions of blastomycin, lots B–2 and B–7, and a 1–100 dilution of a heat-killed yeast-phase antigen of *Blastomyces dermatitidis* (*2*). Thirty-five days later the tests were repeated with the yeast-phase antigen and lot B–7. At intervals thereafter, the animals were retested with a 1–100 dilution of lot B–7 blastomycin.

A third group, composed of 38 normal albino guinea pigs, were tested with a skin test dose of each of several dilutions of an autoclaved filtrate antigen prepared from *Candida (Monilia) albicans* (*7*). Fifteen of these were tested with a 1–100 dilution of this antigen, 11 with a 1–10 and a 1–100 dilution, and 12 with undiluted, a 1–10, and a 1–100 dilution. Fifteen days later these tests were repeated on the same animals in the same manner.

A fourth group, composed of 20 normal albino guinea pigs were skin-tested with 0.1 ml. of a 1–100 dilution of a heat-killed suspension of *Candida (Monilia) albicans* ("vaccine-type" antigen) and a 1–100 dilution of histoplasmin, lot H–15. Fifteen days later these tests were repeated. After 182 days, 19 of these 20 were retested with 0.1 ml. of the autoclaved filtrate antigen of *C. albicans* and lot H–15 histoplasmin. Sixteen of this group were eventually autopsied and cultures prepared from the spleen of each (*8*).

---

[1] From the Office of Field Studies, Tuberculosis Control Division.

All tests were read at 24 hours; a reaction with 5 millimeters or more of induration was considered positive.

RESULTS

The results of these repeated skin tests on normal guinea pigs are summarized in tables 1–10.

TABLE 1.—*Results of simultaneous tests on normal guinea pigs with 1–100 dilution of heat-killed yeast-phase antigen of* Histoplasma capsulatum *and with specified dilutions of histoplasmin, lots H–15 and H–6*

Item	Heat-killed yeast-phase antigen	Histoplasmin					
		Lot H-15			Lot H-6		
	Dilution						
	1-100	Undiluted	1-10	1-100	Undiluted	1-10	1-100
Number of animals tested	10	10	10	10	10	10	10
Number of reactors	0	0	0	0	0	0	0
Percentage of reactors	0	0	0	0	0	0	0

From table 1 it can be seen that none of the 10 animals which were first tested simultaneously with a skin test dose (0.1 ml.) of a 1–100 dilution of the heat-killed yeast-phase antigen of *Histoplasma* and the undiluted, 1–10, and 1–100 dilutions of histoplasmin, lots H–15 and H–6, reacted to any of these antigens in these dilutions. However, when retested 35 days later with the 1–100 dilution of the yeast-phase antigen and each of the three dilutions of lot H–15 histoplasmin (table 2) eight reacted to the undiluted H–15 but none to the other dilutions of H–15 nor to the yeast-phase antigen. Furthermore, on

TABLE 2.—*Results of retesting guinea pigs with 1–100 dilution of heat-killed yeast-phase antigen of* Histoplasma capsulatum *and with specified dilutions of histoplasmin, lot H–15.*

Item	Heat-killed yeast-phase antigen	Histoplasmin			
		Lot H-15			
	35 days after initial tests				79 days
	Dilution				
	1-100	Undiluted	1-10	1-100	1-100
Number of animals tested	10	10	10	10	9
Number of reactors	0	8	0	0	2
Percentage of reactors	0	80.0	0	0	22.2
Average diameter of reaction [1]		8.5			5.5

[1] Induration in millimeters.

the seventy-ninth day (table 2), two of nine, having received one test with undiluted H–6 and two with undiluted H–15 (tables 1 and 2), reacted to a 1–100 dilution of H–15. One of these two still reacted to this dilution of H–15 after 182 days.

Of the 10 animals which were tested simultaneously with a 1–10 dilution of the yeast-phase antigen and with undiluted, 1–10, and 1–100 dilutions of histoplasmin, lots H–15 and H–6 (table 3), 9 reacted on the first test to the 1–10 dilution of the yeast-phase antigen but not to the other antigens in the dilutions employed. When retested 35 days later with the same dilutions of H–15 and a 1–100 dilution of the yeast-phase antigen (table 4), 7 of 9 reacted to undiluted, 1 of 9 to the 1–10 dilution of H–15 and 4 of 9 to the 1–100 dilution of the yeast-phase antigen, but none to the 1–100 dilution of H–15. At 79 days, however, 6 of 9, having received 1 test with a 1–10 dilution of yeast-phase antigen, 2 with undiluted H–15 and 1

TABLE 3.—*Results of simultaneous tests on normal guinea pigs with 1–10 dilution of heat-killed yeast-phase antigen of* Histoplasma capsulatum *and with specified dilutions of histoplasmin, lots H–15 and H–6*

Item	Heat-killed yeast-phase antigen	Histoplasmin					
		Lot H-15			Lot H-6		
	Dilution						
	1-10	Undiluted	1-10	1-100	Undiluted	1-10	1-100
Number of animals tested	10	10	10	10	10	10	10
Number of reactors	9	0	0	0	0	0	0
Percentage of reactors	90.0	0	0	0	0	0	0
Average diameter of reaction [1]	6.7	--------	--------	--------	--------	--------	--------

[1] Induration in millimeters.

TABLE 4.—*Results of retesting guinea pigs with 1–100 dilution of heat-killed yeast-phase antigen of* Histoplasma capsulatum *and with specified dilutions of histoplasmin, lot H–15*

Item	Heat-killed yeast-phase antigen	Histoplasmin Lot H-15			
	35 days after initial tests				79 days
	Dilution				
	1-100	Undiluted	1-10	1-100	1-100
Number of animals tested	9	9	9	9	9
Number of reactors	4	7	1	0	6
Percentage of reactors	44.4	77.8	11.1	0	66.7
Average diameter of reaction [1]	5.4	8.5	5.0	----------	6.7

[1] Induration in millimeters.

with undiluted H–6, reacted to a 1–100 dilution of H–15. Two of these still reacted to this dilution of H–15 after 182 days.

Similar results were obtained with the 10 normal guinea pigs tested with undiluted blastomycin (tables 5 and 6), and with the undiluted

TABLE 5.—*Results of simultaneous tests on normal guinea pigs with 1–100 dilution of heat-killed yeast-phase antigen of* Blastomyces dermatitidis *and with specified dilutions of blastomycin, lots B–7 and B–2*

Item	Heat-killed yeast-phase antigen	Blastomycin					
		Lot B-7			Lot B-2		
	Dilution						
	1-100	Undiluted	1-10	1-100	Undiluted	1-10	1-100
Number of animals tested	11	11	11	11	11	11	11
Number of reactors	1	2	0	0	0	0	0
Percentage of reactors	9.1	18.2	0	0	0	0	0
Average diameter of reaction [1]	5.0	5.0					

[1] Induration in millimeters.

TABLE 6.—*Results of retesting guinea pigs with 1–100 dilution of heat-killed yeast-phase antigen of* Blastomyces dermatitidis *and with specified dilutions of blastomycin, lot B–7*

Item	Heat-killed yeast-phase antigen	Blastomycin Lot B-7			
	35 days after initial tests				79 days
	Dilution				
	1-100	Undiluted	1-10	1-100	1-100
Number of animals tested	10	10	10	10	10
Number of reactors	0	9	0	0	1
Percentage of reactors	0	90.0	0	0	10.0
Average diameter of reaction [1]		7.3			5.0

[1] Induration in millimeters.

TABLE 7.—*Results of testing normal guinea pigs with 1–10 dilution of autoclaved filtrate of* Candida (Monilia) albicans *and of retesting 15 days later with 1–10 and 1–100 dilutions of the filtrate*

Item	Autoclaved filtrate of *C. albicans*		
	Day of observation		
	1	15	
	Dilution		
	1-10	1-10	1-100
Number of animals tested	11	11	11
Number of reactors	0	5	3
Percentage of reactors	0	45.5	27.3
Average diameter of reactions [1]		5.3	5.7

[1] Induration in millimeters.

and 1–10 dilutions of the autoclaved filtrate antigen prepared from *C. albicans* (tables 7 and 8). Repeated testing with a 1–100 dilution of the autoclaved filtrate of *C. albicans*, however, did not result in any reactions to this dilution of this antigen on the second test 15 days after the first.

TABLE 8.—*Results of testing normal guinea pigs with undiluted autoclaved filtrate of* Candida (Monilia) albicans *and of retesting 15 days later with undiluted and with 1–10 and 1–100 dilutions of the filtrate*

Item	Autoclaved filtrate of *C. albicans*			
	Day of observation			
	1	15		
	Dilution			
	Undiluted	Undiluted	1-10	1-100
Number of animals tested	12	12	12	12
Number of reactors	0	6	2	1
Percentage of reactors	0	50.0	10.7	8.3
Average diameter of reaction [1]	----------	7.8	5.0	5.0

[1] Induration in millimeters.

TABLE 9.—*Results of simultaneous tests on normal guinea pigs with 1–100 dilution of heat-killed antigen of* Candida (Monilia) albicans *and with 1–100 dilution of histoplasmin, lot H–15*

Item	Heat-killed antigen *C. albicans*	Histoplasmin Lot H-15
	Dilution	
	1-100	1-100
Number of animals tested	20	20
Number of reactors	9	0
Percentage of reactors	45.0	.0
Average diameter of reaction [1]	5.7	----------

[1] Induration in millimeters.

TABLE 10.—*Results of retesting guinea pigs with heat-killed antigen and with autoclaved filtrate of* Candida (Monilia) albicans *and with histoplasmin, lot H–15*

Item	Heat-killed antigen *C. albicans*	Autoclaved filtrate of *C. albicans*	Histoplasmin Lot H-15
	Day of observation		
	15	182	
	Dilution		
	1-100	1-100	1-100
Number of animals tested	20	19	19
Number of reactors	20	16	12
Percentage of reactors	100.0	84.2	63.2
Average diameter of reaction [1]	7.9	7.1	8.5

[1] Induration in millimeters.

Of the 20 normal animals tested with the heat-killed suspension of *C. albicans*, 9 reacted to the first injection of a 1–100 dilution (table 9) and 20 of 20 to the same amount of the same antigen when retested 15 days later (table 10).

Cultures were prepared from the spleen of each of 11 guinea pigs in the first group, tested repeatedly with histoplasmin; 4 in the second group, tested with blastomycin; and 15 from the fourth group tested with the heat-killed suspension of *C. albicans*. All were negative for pathogenic fungi as reported elsewhere (*8*).

DISCUSSION

It has been shown previously (*1, 2*) that repeated testing with a 1–100 dilution of various lots of histoplasmin and blastomycin and heat-killed antigens prepared from the yeast-phase of *Histoplasma capsulatum* and *Blastomyces dermatitidis* does not irritate nor sensitize normal guinea pigs. However, from the evidence presented above (tables 1–6) it would seem that repeated skin tests with 0.1 ml. doses of undiluted histoplasmin or blastomycin, or two or more injections (intradermally) of the undiluted antigens simultaneously, or tests with a 1–10 dilution of the heat-killed yeast-phase antigen prepared from cultures of *Histoplasma* may sensitize normal guinea pigs to some degree so that they may subsequently react to tests with a 1–10 or occasionally a 1–100 dilution of the same antigen whereas they did not react to these dilutions previously.

The finding that multiple tests with undiluted histoplasmin or blastomycin may sensitize is, as indicated above, based in part on work previously reported (*1, 2*). In these papers it has been shown, for example, that repeated tests with 1–10 and 1–100 dilutions of these particular lots of histoplasmin and blastomycin do not sensitize. Therefore, it is assumed that when used simultaneously with the undiluted antigens, any subsequent reactions of these animals to these antigens are due to the previous use of the undiluted materials.

Similar results have been obtained with an autoclaved filtrate, which is probably carbohydrate in nature, prepared from *Candida (Monilia) albicans* (tables 7 and 8).

The finding that these filtrate antigens, if used in sufficient concentration, may sensitize normal guinea pigs to some degree is supported by the observations of Hirsch and D'Andrea (*3*) and T'Ung and Wong (*5*). The former found that normal guinea pigs could be sensitized by repeated subcutaneous injections of coccidioidin so that they would subsequently react to an intradermal injection of coccidioidin or to the "specific substance," probably carbohydrate in nature, which was isolated from coccidioidin. T'Ung and Wong found that a polysaccharide isolated from *Monilia (Candida) tropicalis*, injected intraperitoneally, was capable of inducing a low degree of sensitivity in guinea pigs, although this substance was inferior to the whole yeast cells as a sensitizing agent.

In table 9 it can be seen that 9 of 20 normal guinea pigs reacted to a skin-test dose of a 1–100 dilution of a heat-killed suspension of *Candida* (*Monilia*) *albicans* on the first injection. Fifteen days later, 20 of 20 reacted to a second injection of the same amount (table 10). Several investigators have found that in animals, injection of whole, dead cells of *Candida* usually sensitizes (*4*, *6*) although such sentitization is weaker than that produced by actual invasion of the tissues by living cells.

The subsequent reaction of the group of animals sensitized by intradermal injections of the heat-killed suspension of *C. albicans* (table 10) to a 1–100 dilution of lot H–15 histoplasmin must be regarded as evidence of a cross reaction, although it should be pointed out that this dilution of this lot of histoplasmin is approximately 10 times the critical *titer* of this antigen for guinea pigs (*2*). Studies on other animals sensitized with living cells of *C. albicans* have shown a much lower degree of cross reaction with this lot of histoplasmin (*9*).

The sensitization of normal animals by repeated injections or two or more simultaneous injections of undiluted histoplasmin or by the use of a 1–100 heat-killed suspension of *C. albicans* would seem to explain the reactions of normal animals to histoplasmin reported in the following paper (*8*).

SUMMARY

The effects of simultaneous and repeated intradermal injections of 0.1 ml. of various dilutions of histoplasmin, blastomycin, an autoclaved filtrate of *Candida* (*Monilia*) *albicans*, heat-killed suspensions of the yeast-phase of *Histoplasma capsulatum* and *Blastomyces dermatitidis*, and of a 1–100 dilution of a heat-killed suspension of *C. albicans* on normal guinea pigs have been studied.

It has been shown that these antigens, if used in sufficient concentrations, may sensitize normal guinea pigs.

REFERENCES

(*1*) Emmons, C. W., Olson, B. J., and Eldridge, W. W.: Studies of the role of fungi in pulmonary disease. I. Cross reactions of histoplasmin. Pub. Health Rep. **60:** 1383 (1945).

(*2*) Howell, Arden: Studies of fungus antigens. I. Quantitative studies of cross-reactions between histoplasmin and blastomycin in guinea pigs. Pub. Health Rep. **62:** 631 (1947).

(*3*) Hirsch, E. F., and D'Andrea, D.: Sensitization of guinea pigs with broth culture filtrates and with killed mycelium of *Coccidioides immitis*. J. Inf. Dis. **40:** 638 (1927).

(*4*) Kurotchkin, T. J., and Lim, C. E.: Anaphylaxis with water soluble specific substance from yeast-like fungi. Proc. Soc. Exper. Biol. and Med. **28:** 223 (1930).

(*5*) T'Ung, T., and Wong, S. C.: Sensitizing capacity of polysaccharide of *Monilia tropicalis*. Proc. Soc Exper. Biol and Med. **41:** 155 (1939).

(*6*) Lim, C. E., and Kurotchkin, T. J.: Quoted in: Skinner, C. E.: The yeast-like fungi: *Candida* and *Brettanomyces*. Bact. Rev. **11:** 227 (1947).

(*7*) Martin, D. S.: Studies on the immunologic relationships among various species of the genus *Candida* (*Monilia*). Am. J. Trop. Med. **22:** 295 (1942).

(*8*) Howell, Arden: Isolation of pathogenic fungi from experimentally inoculated guinea pigs. This issue, page 602.

(*9*) Howell, Arden: Unpublished data.

ISOLATION OF PATHOGENIC FUNGI FROM EXPERIMENTALLY INOCULATED GUINEA PIGS[1]

By ARDEN HOWELL, JR., PH. D., *Senior Mycologist, Public Health Service*

INTRODUCTION

Numerous investigators have reported variable results in attempts to infect laboratory animals with *Histoplasma capsulatum* (*1–8*), *Blastomyces dermatitidis* (*9–16*), and *Candida albicans* (*17–21*). The following study was undertaken, therefore, to determine (1) a sublethal dosage of each of these fungi which would sensitize the animals to skin test antigens prepared from the homologous fungi and (2) to learn if these fungi could be isolated from the inoculated animals after variable periods of time, with or without the production of an apparent generalized infection.

MATERIALS AND METHODS

The strains of *H. capsulatum* (*22*) and *B. dermatitidis* (*23*) employed in these studies were those previously reported. The strains of *Candida* (*Monilia*) *albicans* were isolated from specimens received at the United States Public Health Service laboratory at the University of Kansas Hospital.

Each of 80 normal albino guinea pigs was inoculated intraperitoneally with graded doses of a 1–100 saline suspension of the living yeast phase of *H. capsulatum*, 82 with graded doses of a similar suspension of the living yeast phase of *B. dermatitidis*, and 35 with graded doses of a 1–100 saline suspension of living cells of *Candida* (*Monilia*) *albicans*.

The suspension of the yeast phase of *Histoplasma* was prepared from 5-day-old cultures grown on sealed blood agar slants and incubated at 37° C. (*24*); that of *Blastomyces* from 7-day-old cultures of the yeast phase grown on Difco brain heart infusion agar at 37° C.; and that of *C. albicans* from 2-day-old cultures grown on Sabouraud's agar at 37° C.

The dosages employed are shown in table 1.

TABLE 1.—*Number of guinea pigs inoculated intraperitoneally with specified dosages of 1–100 suspension of yeast-phase of* Histoplasma capsulatum, *of* Blastomyces dermatitidis, *and of* Candida (Monilia) albicans

Fungus employed	Dosage (ml. 1–100 suspension per gram of body weight)									Total
	0.00100–0.00199	0.00200–0.00299	0.00300–0.00399	0.00400–0.00499	0.00500–0.00599	0.00600–0.00699	0.00700–0.00799	0.00800–0.00899	0.00900–0.00999	
Histoplasma capsulatum	7	13	20	16	15	9	0	0	0	80
Blastomyces dermatitidis	5	9	10	26	8	4	5	5	1	82
Candida albicans	7	12	12	4	0	0	0	0	0	35

---

[1] From the Office of Field Studies, Tuberculosis Control Division.

All animals were skin-tested prior to inoculation with a skin-test dose of a 1–100 dilution of an antigen prepared from the homologous organism [i. e., histoplasmin, blastomycin, or an antigen prepared from *C. albicans* (*25*)]. No animal reacted to any antigen in the dilution employed.

The animals were weighed at the time of inoculation and at intervals thereafter and were skin-tested with various antigens at intervals. Thirteen of those inoculated with *Histoplasma* died between 30 and 247 days after inoculation; the remainder were sacrificed at intervals varying from 2 to 10 months. Twenty-eight of those inoculated with *Blastomyces* died between 18 and 289 days after inoculation; the remainder were sacrificed at intervals of 1 to 11 months. Four of the group inoculated with *C. albicans* died between 11 and 63 days after inoculation; 24 of the remainder were sacrificed at intervals varying from 49 to 76 days after inoculation.

All animals were autopsied and any marked pathological change was noted. If abscesses or other lesions were present material from these lesions was used for culture. In all animals in which there were no marked pathological changes the spleen was removed, a portion of each fixed for sectioning, and the remainder used for cultures.

Cultures from the animals inoculated with *Histoplasma* were made on each of two plates of brain heart infusion blood agar and potato dextrose agar as previously reported (*22*); those from animals inoculated with *Blastomyces* or *C. albicans* on two plates of the same blood agar and two plates of Sabouraud's agar. Streptomycin and penicillin in concentrations of 40 and 20 units, respectively, per milliliter of medium were added to all media. One plate of each medium was then incubated at 37° C. and the other at room temperature (approximately 25° C.).

In addition to the animals which were inoculated with *Histoplasma*, *Blastomyces*, and *C. albicans*, 41 normal albino guinea pigs were studied as controls. These animals were divided into three groups. The first group, composed of 10 animals, were skin-tested with a skin-test dose of a 1–100 dilution of each of several antigens on the day they were received at the laboratory and sacrificed 3 days later. The second group, composed of 15 animals, were kept under observation for a total of 182 days and were kept in the normal animal room. The third group, composed of 16 animals, were kept in the same room with the inoculated animals described above and were under observation for 232 to 259 days. Three of this group died between the 244th and 258th day of observation. All of the animals in groups two and three were skin tested at intervals with various antigens. All were then sacrificed at the end of the periods indicated.

Each of these 41 normal animals was autopsied. At autopsy any marked pathological changes were noted and the spleen of each removed. A portion of the spleen of each was fixed for sectioning and the remainder used for cultures.

Cultures of each were made on two plates of the brain heart infusion blood agar, one plate of potato dextrose agar and one plate of Sabouraud's agar. One plate of the blood agar was incubated at 37° C.; the other three plates at room temperature (approximately 25° C.).

All positive cultures or cultures suspected of being positive were confirmed by subculturing the suspected colonies on the appropriate medium at room temperature.

RESULTS

1. *Animals inoculated with Histoplasma capsulatum.*—With the dosages employed, in animals inoculated intraperitoneally with the living yeast phase of *H. capsulatum* there appeared to be no correlation between the size of the inoculating dose and the number of animals which developed an apparently generalized infection.

Of the 80 guinea pigs in this group, an apparently generalized infection developed in 3, or 3.8 percent, of the total inoculated (table 2).

TABLE 2.—*Summary of findings on guinea pigs developing apparently generalized infection following intraperitoneal inoculation with 1–100 saline suspension of yeast-phase of* Histoplasma capsulatum

Guinea pig No.	Dosage (ml. 1–100 suspension per gram of body weight)	Skin reaction to				Net weight change		Time of death (Days)	Gross pathology at autopsy	Results of culture
		Histoplasmin, lot H–15		Polysaccharide fraction (histoplasmin, lot H–17)		Gms.	Percentage			
		1–100 dilution		1.0 mg./ml.						
		Days after inoculation								
		40	75	89	47					
230	0.00345	–	–	–	–	–110	–25.3	[1] 90	Moderate	Lung+; spleen+
260	0.00294	–	--------	--------	+[2]	+15	+2.9	48	Moderate	Spleen+
267	0.00291	–	--------	--------	--------	–185	–35.9	[3] 43	Moderate	Spleen unknown (contaminated)

[1] Sacrificed.

[2] Only 5 mm. of induration.

[3] Died as a result of a laboratory accident.

Two of these three animals underwent a progressive loss of weight, the third showed a slight increase in weight at the time of death. Of the two which showed a progressive weight loss, one died on the forty-third day apparently from a laboratory accident and the other was sacrificed 90 days after inoculation. None of the three reacted to any skin test at any time except one (table 2). All three showed moderate pathology at autopsy, particularly in the thoracic cavity.

Cultures prepared from the lungs of guinea pig No. 230 were positive for *Histoplasma:* cultures of the lungs of the other two animals were overgrown with bacteria. Cultures prepared from the spleens of guinea pigs Nos. 230 and 260 were positive; cultures of the spleen of the third were overgrown with contaminants.

One of the 80 apparently was neither infected not sensitized by the inoculation. Repeated skin tests with a 1–100 dilution of histoplasmin, lot H–15 (*23*) were all negative. No gross pathology was noted at autopsy 91 days after inoculation, by which time the animal had gained approximately 20.0 percent in weight. Sections and cultures made from the spleen at autopsy were both negative for *Histoplasma.*

Of the remaining 76 animals inoculated with *Histoplasma,* 11 died (table 3). Two of these apparently died from laboratory accidents. These two reacted to a skin-test dose of a 1–1000 dilution of histoplasmin, lot H–15, 26 days after inoculation; both showed a marked increase in weight; neither showed any marked pathology at autopsy. However, cultures prepared from the spleens of both were positive.

The cause of death of the other 9 animals which died during the course of the experiment was not determined. All reacted to a skin-test dose of a 1–1000 dilution of histoplasmin, lot H–15, 26 days after inoculation, and 2 to a 1–100 dilution of this same antigen 202 days after inoculation. Eight of the nine gained a considerable amount of weight while under observation; only two showed any marked pathology at autopsy. In these two, guinea pigs Nos. 193 and 200, there were slight to moderate changes in the thoracic cavity. Cultures of material from the lungs of both and of the spleen of No. 193 were overgrown with bacteria. Cultures of the spleen of guinea pig No. 200 yielded *Histoplasma.* Of the remaining seven which showed essentially no pathology at autopsy, *Histoplasma* was isolated from the spleens of four. These 4 animals were autopsied 79, 122, 30, and 140 days after inoculation. There is no clear evidence, therefore, that any of these 11 animals died from experimental histoplasmosis.

The remaining 65 guinea pigs remained apparently healthy. These were sacrificed 2 to 9 months after inoculation. All, at some time, reacted to a skin-test dose of at least a 1–100 dilution of histoplasmin, lot H–15, and 54 reacted, at some time, to a 1–1000 dilution of this antigen. All gained a considerable amount of weight, and none showed any marked pathology at autopsy. However, *Histoplasma* was isolated from the spleens of 39, or 60.0 percent of these animals. Among 31 animals kept under observation for a period of 6 months or longer, cultures prepared from 14, or 45.2 percent, were positive. It is interesting that those animals from which cultures were obtained were not necessarily those which had received the greater doses.

It was possible to isolate *Histoplasma* from the spleens of 4 of 10

TABLE 3.—*Summary of findings on guinea pigs dying*[1] *after inoculation with 1–100 suspension of yeast-phase of* Histoplasma capsulatum

Guinea pig No.	Dosage (ml. 1–100 suspension per gram of body weight)	Skin reaction to Histoplasmin, lot H-15					Net weight change		Time of death (days)	Gross pathology at autopsy	Results of culture
		Dilution									
		1–1000	1–100								
		Days after inoculation					Gms.	Percentage			
		26	171	186	202	223					
156	0.00104	+					+470	+154.0	163	Essentially none	Lung –; spleen –.
158	0.00333	+					+245	+54.4	79	Essentially none	Spleen +.
160	0.00267	+					+280	+74.7	[2] 48	Essentially none	Spleen +.
167	0.00263	+					+250	+65.8	[2] 48	Essentially none	Spleen +.
169	0.00253	+					+20	+5.1	122	Essentially none	Spleen +.
185	0.00562	+	+	+	+		+455	+102.3	209	Essentially none	Spleen –.
189	0.00476	+					+105	+25.0	30	Essentially none	Spleen +.
190	0.00556	+					+180	+40.0	140	Essentially none	Spleen +.
193	0.00548	+					+140	+38.4	106	Slight (lungs)	Spleen unknown (contaminated); lung unknown (contaminated).
199	0.00441	+	+	+	+	+	+310	+91.2	247	Essentially none	Spleen –.
200	0.00455	+							152	Moderate (lungs)	Spleen + lung unknown (contaminated).

[1] Exclusive of guinea pigs number 260 and 267 included in table 1.
[2] Died as a result of laboratory accidents.

apparently normal, healthy animals which had been inoculated with large doses of this fungus intraperitoneally at least 9 months previously.

None of these 65 animals, at any time during the course of the experiment, nor at autopsy, showed any signs of infection with the fungus except for the development of a sensitivity to the homologous organism or its products at some time after inoculation.

Of the 77 animals which failed to develop any visible signs of experimental histoplasmosis, other than a skin sensitivity to histoplasmin, it was possible to isolate *Histoplasma*, after variable periods of time, from the spleens of 46, or 59.6 percent.

2. *Animals inoculated with Blastomyces dermatitidis.*—In animals inoculated intraperitoneally with the living yeast phase of *Blastomyces dermatitidis*, as with the animals similarly inoculated with *Histoplasma*, there appeared to be no correlation, with the narrow ranges of dosages employed, between the size of the inoculating dose and the number of animals which developed an apparent generalized infection

Of 82 guinea pigs in this group, 17 developed an apparent infection (table 4); 13 of these 17 died between the 18th and 127th day after inoculation; the remaining 4 were sacrificed between the 41st and 257th day. Of the 13 which died, 11 showed moderate to marked loss of weight, 5 consistently failed to react to a skin-test dose of a 1–100 dilution of blastomycin, lot B–2 (*23*); 10 showed extensive, and 3 moderately extensive, pathology at autopsy; cultures obtained from one or more organs of each were positive for *Blastomyces*. One of these, guinea pig No. 117, died as a direct result of a laboratory accident. This animal had failed to react to a skin test dose of a 1–100 dilution of blastomycin, lot B–2, and even though it had gained a considerable amount of weight, showed extensive pathology at autopsy.

Of the 4 in the above group which were sacrificed, 3 showed a slight to marked increase in weight; all 4 failed repeatedly to react to a skin-test dose of a 1–100 dilution of blastomycin, lot B–2 or B–7 (*23*); and 2 showed moderate to extensive pathology at autopsy. A third, sacrificed 257 days after inoculation, by which time it had gained over 200 grams, or 47.9 percent, in weight, showed an abscess in the liver approximately 5 cm. in diameter at autopsy. Cultures obtained from one or more tissues of each of these 4 animals were positive for *Blastomyces*. The essential findings on each of these 17 guinea pigs are summarized in table 4.

Of the remaining 65 guinea pigs, 15 died (table 5). Two of these apparently died as a result of laboratory accidents. One of these reacted to a skin-test dose of a 1–1000 dilution of blastomycin, lot B–2, 47 days after inoculation, while the other did not. Both gained

TABLE 4.—*Summary of findings on guinea pigs developing apparently generalized infection following intraperitoneal inoculation with 1–100 saline suspension of yeast-phase of* Blastomyces dermatitidis

<table>
<tr><th rowspan="5">Guinea pig No.</th><th rowspan="5">Dosage (ml. 1-100 suspension per gram of body weight)</th><th colspan="5">Skin reaction to blastomycin</th><th colspan="2">Net weight change</th><th rowspan="5">Time of death (days)</th><th rowspan="5">Gross pathology at autopsy</th><th rowspan="5">Results of culture</th></tr>
<tr><th colspan="2">Lot B-2</th><th colspan="3">Lot B-7</th><th rowspan="4">Gms.</th><th rowspan="4">Percentage</th></tr>
<tr><th colspan="5">Dilution</th></tr>
<tr><th>1-1000</th><th>1-100</th><th>1-1000</th><th colspan="2">1-100</th></tr>
<tr><th colspan="5">Days after inoculation</th></tr>
<tr><td></td><td></td><td colspan="2">47</td><td colspan="3"></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>113</td><td>0.00471</td><td></td><td>−</td><td colspan="3"></td><td>−210</td><td>−33.0</td><td>62</td><td>Extensive</td><td>Liver +; spleen +; lung +.</td></tr>
<tr><td>115</td><td>0.00158</td><td></td><td></td><td colspan="3"></td><td>−5</td><td>−7.9</td><td>18</td><td>Extensive</td><td>"Pancreas"+.</td></tr>
<tr><td>116</td><td>0.00440</td><td></td><td>−</td><td colspan="3"></td><td>−25</td><td>−5.5</td><td>89</td><td>Extensive</td><td>"Pancreas"+; spleen +.</td></tr>
<tr><td>117</td><td>0.00450</td><td></td><td>−</td><td colspan="3"></td><td>+190</td><td>+28.5</td><td>[3] 56</td><td>Extensive</td><td>"Pancreas"+; spleen +.</td></tr>
<tr><td>122</td><td>0.00240</td><td></td><td>−</td><td colspan="3"></td><td>+75</td><td>+18.0</td><td>80</td><td>Extensive</td><td>Liver abscess +.</td></tr>
<tr><td>125</td><td>0.00198</td><td></td><td>−</td><td colspan="3"></td><td>+50</td><td>+9.9</td><td>[1] 46</td><td>Extensive</td><td>Spleen +; subcut. absc. +.</td></tr>
<tr><td>131</td><td>0.00571</td><td>+</td><td></td><td colspan="3"></td><td>[2] −10</td><td>−1.9</td><td>62</td><td>Extensive</td><td>Spleen +.</td></tr>
<tr><td></td><td></td><td></td><td>28</td><td></td><td>187</td><td>252</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>141</td><td>0.00566</td><td></td><td>−</td><td></td><td>−</td><td></td><td>−220</td><td>−31.1</td><td>[1] 190</td><td>Moderate</td><td>Spleen +; "pancreas" +.</td></tr>
<tr><td>147</td><td>0.00670</td><td></td><td>−</td><td></td><td></td><td></td><td>−160</td><td>−26.8</td><td>40</td><td>Extensive</td><td>Spleen +; liver absc. +.</td></tr>
<tr><td>151</td><td>0.00799</td><td></td><td>−</td><td></td><td></td><td>−</td><td>+210</td><td>+47.9</td><td>[1] 257</td><td>Liver abscess</td><td>Spleen +; liver absc. +.</td></tr>
<tr><td></td><td></td><td></td><td>41</td><td>76</td><td colspan="2">40</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>233</td><td>0.00364</td><td></td><td></td><td></td><td colspan="2">+</td><td>−135</td><td>−24.5</td><td>113</td><td>Extensive</td><td>Spleen +; abdom. absc. +.</td></tr>
<tr><td>239</td><td>0.00284</td><td></td><td>+</td><td>−</td><td colspan="2"></td><td>−55</td><td>−15.6</td><td>93</td><td>Liver abscesses</td><td>Liver abscess +.</td></tr>
<tr><td>262</td><td>0.00391</td><td></td><td></td><td></td><td colspan="2">+</td><td>−130</td><td>−25.4</td><td>51</td><td>Liver abscesses</td><td>Liver abscess +.</td></tr>
<tr><td>270</td><td>0.00531</td><td></td><td></td><td></td><td colspan="2">+</td><td>−90</td><td>−23.9</td><td>52</td><td>Moderate</td><td>Liver abscess +.</td></tr>
<tr><td>271</td><td>0.00364</td><td></td><td></td><td></td><td colspan="2">+</td><td>−250</td><td>−45.5</td><td>70</td><td>Extensive</td><td>Liver abscess +.</td></tr>
<tr><td></td><td></td><td></td><td>38</td><td>64</td><td colspan="2"></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>132</td><td>0.00667</td><td></td><td>−
33</td><td>+</td><td colspan="2"></td><td>−45</td><td>−7.5</td><td>127</td><td>Extensive</td><td>Subcut, abscess +.</td></tr>
<tr><td>137</td><td>0.00449</td><td></td><td>−</td><td></td><td colspan="2"></td><td>+40</td><td>+9.0</td><td>[1] 41</td><td>Moderate</td><td>Spleen +; "pancreas" +.</td></tr>
</table>

[1] Sacrificed.

[2] Weight at 56 days.

[3] Died as a result of laboratory accident.

a large amount of weight before death. At autopsy, both showed some degree of pathology. Cultures from material taken at autopsy of both animals were negative for *Blastomyces*, though those from one of the animals were overgrown with bacteria.

The cause of death of the other 13 animals which died was undetermined. Twelve showed a marked increase in weight; and 10 at some time reacted to one or more repeated skin tests with a 1–1000 dilution of blastomycin, lot B–2 or B–7. At autopsy, six showed some degree of pathology. Of these, only one gave cultures positive for *Blastomyces*, while of the seven which showed essentially no pathology, *Blastomyces* was isolated from the spleen of two and the lungs of one. It would seem doubtful, therefore, that any of these animals died from experimental blastomycosis. The essential findings on each of these 15 animals are shown in table 5.

The remaining 50 guinea pigs remained apparently healthy. All, at some time, reacted to a skin-test dose of at least a 1–100 dilution of blastomycin, lot B–2 or B–7; 22 at some time to at least a 1–1000 dilution of lot B–2, and 37 to at least a 1–1000 dilution of lot B–7. All gained markedly in weight. None showed any marked pathology at autopsy, although there were small abscesses in the liver of two, in the pelvic region of two, "pancreas" of one, and abdominal wall of one. However, *Blastomyces* was isolated from 1 or more tissues removed at autopsy from 26, or 52.0 percent, of these animals. Among 33 animals kept under observation for a period of 6 months or longer cultures prepared from 15, or 45.5 percent, were positive.

It was possible to isolate *Blastomyces dermatitidis* from the spleens of four of 9 guinea pigs which had been inoculated intraperitoneally with this fungus at least 10 months previously.

Of the 65 which failed to show any visible signs of experimental blastomycosis, other than a skin sensitivity to blastomycin, it was possible to isolate *Blastomyces*, after variable periods of time, from 30, or 46.2 percent.

As with the animals inoculated with *Histoplasma*, the animals from which cultures were obtained were not necessarily those which received the greater doses.

3. *Animals inoculated with Candida (Monilia) albicans.*—Of 35 guinea pigs inoculated with *C. albicans*, none developed an apparently generalized infection. Four died between the 11th and 63d day after inoculation (table 6). The animal which died on the 11th day apparently died from an intestinal obstruction. The other three reacted to at least a 1–100 dilution of an autoclaved filtrate antigen prepared from the homologous fungus (*25*), two of them to a 1–1000 dilution, on the 41st day. Two of the three lost weight. However, there were no marked gross pathological findings at autopsy in any one of the four, and cultures from two were negative for *C. albicans*. No

TABLE 5.—*Summary of findings on guinea pigs dying*[1] *after inoculation with 1–100 suspension of yeast-phase of* Blastomyces dermatitidis

Guinea pig no.	Dosage (ml. 1–100 suspension per gram of body weight)	Skin reaction to blastomycin							Net weight change		Time of death (days)	Gross pathology at autopsy	Results of culture
		Lot B-2			Lot B-7				Gms.	Percentage			
		Dilution											
		1–1000		1–100	1–1000	1–100							
		Days after inoculation											
		47	64		64	215	250	280					
101	0.00447	+	+	---	+	+	---	---	+110	+16.4	227	Essentially none	Lung −.
102	0.00429	+	+	---	+	---	---	---	+270	+77.1	208	Essentially none	Spleen +.
103	0.00330	+	−	---	+	---	---	---	+195	+42.8	170	Essentially none	Spleen −.
107	0.00400	−	---	---	---	---	---	---	+165	+33.0	[2] 56	Moderate	Spleen −; lung −.
121	0.00151	+	+	---	+	+	+	+	+385	+58.0	289	Orchitis	Testis −.
126	0.00505	+	+	---	+	+	+	---	+110	+22.2	209	Necrosis of liver	Liver −.
127	0.00412	+	+	---	+	---	---	---	---	---	153	Liver abscess	Liver absc. —spleen −;
133	0.00389	+	---	---	---	−	---	---	−70	−10.9	218	Slight (lungs)	Lung −; "pancreas" −.
148	0.00452	+	---	---	---	---	---	---	+110	+19.9	[2] 63	Slight (lungs)	Spleen unknown (contaminated)
150	0.00495	−	+	---	+	---	---	---	+140	+27.7	98	Essentially none	Spleen +.
		Days after inoculation											
				38	38								
149	0.00860	---		+	+	---			+150	+32.3	40	Absc. in diaphragm	Spleen −.
157	0.00785	---		−	---	---			+240	+53.8	158	Essentially none	Spleen −.
162	0.00802	---		−	---	---			---	---	132	Essentially none	Spleen −.
171	0.00769	---		−	---	---			---	---	189	Essentially none	Lung +.
		Days after inoculation											
					48	75	95	125					
191	0.00400	---			+	−	+	+	+155	+31.0	130	Moderate	Spleen +.

TABLE 6.—*Summary of findings on guinea pigs dying after inoculation with 1–100 suspension of* Candida (Monilia) albicans

Guinea pig number	Dosage (ml. 1-100 suspension per gram of body wgt.)	Skin reaction to autoclaved filtrate of *C. albicans* 41 days after inoculation		Net weight change		Time of death (days)	Gross pathology at autopsy	Results of culture
		Dilution						
		1-1000	1-100	Gms.	Percentage			
351	0.00351	+	+	+40	+7.0	63	Post mortem changes only.	No culture made.
357	0.00431	−	+	−90	[1]−15.5	54	Essentially none	Spleen−.
368	0.00364	+	+	−100	−18.2	45	Abdominal adhesions.	Spleen−; lung−; adrenal−.
383	0.00235	--------	--------	−30	−7.1	11	Intestinal obstruction.	No culture made.

[1] Weight taken 5 days before death.

cultures were made from the other two. Therefore, although the cause of death of three of these animals was not determined, it would not seem that they died as a result of the inoculation of *C. albicans*.

Of the remaining 31 animals, 24 were sacrificed. All of these showed a definite and constant increase in weight, although the group sacrificed during the third month were markedly dehydrated in appearance at the time they were sacrificed. All but one reacted to a skin-test dose of at least a 1–100 dilution of the autoclaved filtrate antigen of *C. albicans* 41 days after inoculation. At autopsy, none of the 24 which were sacrificed showed any gross pathology except for abdominal adhesions in five. Cultures prepared from the spleens of each of these 24 were negative except for one sacrificed on the 49th day, from which *C. albicans* was isolated. It would seem, therefore, that none of these animals developed a widespread experimental infection, with the dosages employed for inoculation, although the majority (33 of 35, or 94.3 percent) did develop a skin sensitivity to the homologous fungus or its products.

4. *Normal animals.*—Forty-one normal guinea pigs, divided into 3 groups, were included in this study as controls.

The first group, composed of 10 animals, were tested with a skin-test dose of a 1–100 dilution of histoplasmin, lot H–15, blastomycin, lot B–7, and the autoclaved filtrate antigen of *C. albicans* on the same day the animals were received into the laboratory. None reacted to any of these antigens in this dilution. Each of these animals was sacrificed 3 days later. At autopsy none showed any gross pathology; cultures from the spleen of each were negative for pathogenic fungi.

The second group, composed of 15 animals, were kept under observation for a period of 182 days in the normal animal room. At the time they were sacrificed (on the 182d day of observation) 4 reacted to a skin-test dose of a 1–100 dilution of histoplasmin, lot

H-15.[2] None reacted to the same dilution of blastomycin, lot B-7. At autopsy none showed any gross pathology; and cultures from the spleen of each were negative for pathogenic fungi.

The third group, composed of 16 animals, were kept in the same room with the animals inoculated with *Histoplasma*, *Blastomyces*, and *C. albicans*. Three of these animals died between the 244th and 258th day of observation. At autopsy two showed some gross pathology, but cultures from the spleens of each of the three were negative for pathogenic fungi.

Of the remaining 13, 8 were sacrificed on the 232d day of observation. At this time, three of these reacted to a skin-test dose of a 1-100 dilution of histoplasmin, lot H-15, and four to the same dilution of the *C. albicans* antigen.[2] None, however, reacted to a 1-100 dilution of blastomycin, lot B-7. The remaining 5 were sacrificed on the 259th day. At this time none of these reacted to a skin-test dose of a 1-100 dilution of histoplasmin, lot H-15, blastomycin, lot B-7, or the autoclaved filtrate antigen prepared from *C. albicans*. None of these 13 animals showed any marked gross pathology at autopsy. Cultures from the spleens of each were negative for pathogenic fungi.

DISCUSSION

From the data presented above it would seem that guinea pigs are relatively resistant to infection with *H. capsulatum* when this fungus is inoculated intraperitoneally, and that, in the dosage range used, there was little correlation between the dosage employed for inoculation and the number which developed a generalized extensive infection. Only 3 of 80, or 3.8 percent, of the animals included in this study appeared to develop such an infection from an intraperitoneal inoculation of relatively large doses of the living yeast phase from 5-day-old cultures incubated at 37° C. This finding is in general agreement with most of the reports on infection of these animals with this fungus. Reid et al. (*5*), for example, reported a generalized infection in one guinea pig inoculated with growth from a culture of the yeast phase. Hansmann and Schencken (*2*) reported that guinea pigs inoculated intraperitoneally with material from a biopsy of skin and lymph nodes from a human case of histoplasmosis, from which *Histoplasma* was subsequently isolated in culture, failed to show any evidence of infection several months after inoculation. Similarly, Parsons and Zarafonetis (*8*) failed to induce infection in guinea pigs with material from a biopsy from a human case.

Of the remaining 77 animals in the series reported above (table 1), 76 developed some degree of skin sensitivity. This is evident from the fact that all of these 76 reacted, at some time after inoculation, to a skin-test dose of at least a 1–100 dilution of histoplasmin, lot H–15, whereas none of them had reacted to this dilution of this antigen prior to inoculation.

---

[2] These reactions are explained in Studies of Fungus Antigens, III. See p. 595.

It has also been demonstrated that *Histoplasma* may be recovered from the spleens of apparently healthy guinea pigs inoculated with this fungus as long as 10 months previously although the animals showed no signs of gross pathology at autopsy. This is in agreement with a recent paper by Emmons et al. (*26*) in which was reported the isolation of *Histoplasma* from 1 mouse and 10 rats, none of which showed any gross lesions at autopsy. From these animals *Histoplasma* was isolated most frequently from the spleen and liver. Emmons (*26*) further reported that guinea pigs commonly recover from the acute phase of infection with *Histoplasma* and survive indefinitely and that it was possible to isolate *Histoplasma* regularly from experimentally infected guinea pigs kept in the laboratory under observation for over 2 years, even though there were no gross abnormalities observed at autopsy.

It would also seem that guinea pigs are relatively resistant to infection with *B. dermatitidis*, when this fungus is inoculated intraperitoneally, and that there is little correlation between the dosage employed and the number which develop a generalized infection. Only 17 of 82, or 20.7 percent, apparently developed such an infection from the intraperitoneal inoculation of large doses of the living yeast phase from a 7-day-old culture incubated at 37° C. Similar results have been reported by various investigators. Benham (*15*) reported that dogs and monkeys are very susceptible to infection with this fungus but that less extensive lesions develop in guinea pigs. DeMonbreun (*16*) found that guinea pigs inoculated with this fungus develop localized abscesses which soon healed following subcutaneous or intradermal inoculations. Others (*9–14*) have obtained variable results.

Although it would seem that guinea pigs are relatively resistant to an intraperitoneal inoculation of *B. dermatitidis*, a comparison of this group and the group inoculated with *Histoplasma* indicates that they are more susceptible to inoculation with this fungus than to inoculation with *Histoplasma*. For example, of 70 guinea pigs which received doses of *Blastomyces* comparable in volume of packed cells, to the 80 inoculated with *Histoplasma*, 16 of the 70 developed a generalized infection whereas only 3 of 80 of those inoculated with *Histoplasma* appeared to develop such an infection.

Of the remaining 65 guinea pigs inoculated with *Blastomyces*, 61 reacted, at some time after inoculation, to a skin-test dose of at least a 1–100 dilution of blastomycin, lot B–2 or B–7. None had reacted to this dilution of blastomycin prior to inoculation. The reason for the failure of the remaining four animals to become sensitized was not determined.

It has also been demonstrated above that *Blastomyces* may be recovered from the spleens of apparently healthy guinea pigs which had been inoculated with this fungus as long as eleven months previously, and which showed no gross lesions at autopsy.

Of 35 guinea pigs similarly inoculated with large doses of *Candida (Monilia) albicans* none apparently developed more than a transient infection. This is in accord with the results obtained by Ninni and Fittipaldi (*21*) who reported that one-fifth of an agar slant culture of pathogenic monilias inoculated intraperitoneally failed to kill guinea pigs, and of Benham (*20*) and Nye et al (*19*). Benham reported that guinea pigs are less susceptible to infection with *C.* (*M.*) *albicans* than are rabbits. Nye et al. reported that of 38 guinea pigs inoculated intraperitoneally with 250 × 10^6 organisms from 4-day broth cultures of *Parasaccharomyces* A. (pathogenic for rabbits) only one developed an extensive infection. This animal died on the fourth day after inoculation with a purulent peritonitis. Others (*17, 18*) have reported variable results.

Although none of the animals inoculated with *C. albicans* developed an apparently generalized infection, 33 of 35 were sensitized so that at 41 days after inoculation they reacted to a skin-test dose of at least a 1–100 dilution of an autoclaved filtrate antigen prepared from this fungus (*25*). This group of animals were similar to those inoculated with both *Histoplasma* and *Blastomyces* in that in the majority of the animals there were no demonstrable lesions at autopsy. However, they differed in that *C. albicans* was recovered in culture from the spleen of only one of 26 animals autopsied, even though all of the 26 died or were sacrificed not later than 76 days after inoculation.

Finally, it has been shown that none of these pathogenic fungi could be isolated from the spleens of 41 normal animals, 31 of which were kept under observation for a minimum of 182 days in the laboratory before autopsy. Sixteen of these normal guinea pigs were kept in the same room with the animals inoculated with *Histoplasma, Blastomyces*, and *C. albicans*. This would seem to indicate that these infections are not readily transmitted from one individual to another, and is in agreement with the report of Emmons et al. (*26*) that histoplasmosis was not transmitted from a naturally acquired infection in a dog to other dogs kept for months in the same cage with it. This failure to isolate a pathogenic fungus from these normal guinea pigs lends support to the conclusion that the cultures isolated from the inoculated animals were isolated as a result of the inoculation.

It should be noted that although there appeared to be little correlation between the size of the dosage used and the number of animals which developed extensive infections with any of the three fungi studied, the dosages employed covered only a five-to nine-fold range.

It is possible that had larger doses been used for inoculation, some correlation might have become apparent. It would also seem that the percentage of experimentally inoculated animals from which *H. capsulatum* and *B. dermatitidis* can be isolated decreases with the length of time after inoculation.

SUMMARY

A study has been made on the susceptibility of guinea pigs to intraperitoneal inoculations with the yeast phase of *H. capsulatum*, *B. dermatitidis*, and *Candida* (*Monilia*) *albicans*. With the dosages and strains of these fungi employed, it has been shown that:

1. Only 3 of 80 guinea pigs inoculated in this manner with large doses of the yeast phase of *Histoplasma* and 17 of 82 similarly inoculated with *Blastomyces* developed a generalized infection. Of 35 similarly inoculated with *C. albicans*, none developed such an infection.
2. There was no correlation between the size of the inoculating dose and the number of animals which developed generalized infection.
3. Relatively small doses of these fungi are as effective as larger ones in producing skin sensitization of these animals.
4. Both *H. capsulatum* and *B. dermatitidis* could be readily isolated from the spleens of apparently healthy guinea pigs which had been inoculated with variable doses of these fungi 9 to 10 months previously, even though there were no gross lesions apparent at autopsy. *C. albicans* could not be recovered from guinea pigs inoculated with this fungus 2 to 3 months previously.

REFERENCES

(*1*) DeMonbreun, W. A.: The cultivation and cultural characteristics of Darling's *Histoplasma capsulatum*. Am. J. Trop. Med. **14**: 93 (1934).

(*2*) Hansmann, G. H., and Schencken, J. R.: A unique infection in man caused by a new yeast-like organism, a pathogenic member of the genus *Sepedonium*. Am. J. Path. **10**: 731 (1934).

(*3*) DeMonbreun, W. A.: The dog as a natural host for *Histoplasma capsulatum*. Am. J. Trop. Med. **19**: 565 (1939).

(*4*) Van Pernis, P. A., Benson, M. E., and Hollinger, P. H.: Specific cutaneous reactions with histoplasmin. J. A. M. A. **117**: 436 (1941).

(*5*) Reid, J. D., Scherer, J. H., Herbut, P. A., and Irving, H.: Systemic histoplasmosis. J. Lab. & Clin. Med. **27**: 419 (1942).

(*6*) Tager, M., and Liebow, A. A.: Observations on histoplasmosis. Induced infection in the mouse. Yale J. Biol. & Med. **14**: 469 (1942).

(*7*) Henderson, R. G., Pinkerton, H., and Moore, L. T.: *Histoplasma capsulatum* as a cause of chronic ulcerative enteritis. J. A. M. A. **118**: 885 (1942).

(*8*) Parsons, R. J., and Zarafonetis, C. J. D.: Histoplasmosis in man. Arch. Int. Med. **75**: 1 (1945).

(*9*) Ricketts, H. T.: Oidiomycosis (blastomycosis) of the skin and its fungi. J. Med. Res. **6**: 377 (1901).

(*10*) Bowen, J. T., and Wolbach, S. B.: A case of blastomycosis: the results of culture and inoculation experiments. J. Med. Res. **15**: 167 (1906).

(*11*) Davis, B. F.: The immunological reactions of oidiomycosis (blastomycosis) in the guinea pig. J. Inf. Dis. **8**: 190 (1911).

(*12*) Stober, A. M.: Systemic blastomycosis. Arch. Int. Med. **13**: 509 (1914).

(*13*) Long, E. R.: Specific necrosis in the infectious granulomas. J. A. M. A. **87**: 1441 (1926).

(*14*) Michelson, I. D., and Dulaney, A. D.: Experimental blastomycosis. South. M. J. **24**: 1034 (1931).
(*15*) Benham, R. W.: The fungi of blastomycosis and coccidioidal granuloma. Arch. Dermat. & Syph. **30**: 385 (1934).
(*16*) DeMonbreun, W. A.: Experimental chronic cutaneous blastomycosis in monkeys. Arch. Dermat. & Syph. **31**: 831 (1935).
(*17*) Ashford, B. K.: Further experimentation in animals with a *Monilia* commonly found in sprue. Am. J. M. Sc. **131**: 520 (1916).
(*18*) Smith, L. W.: The role of *M. psilosis* (*Ashfordi*) in experimental sprue. J. A. M. A. **83**: 1549 (1924).
(*19*) Nye, R. N., Zerfas, L. G., and Cornwell, M. A.: The pathogenicity of yeast-like fungi isolated from the human gastro-intestinal tract. Am. J. M. Sc. **178**: 515 (1929).
(*20*) Benham, R. W.: Certain monilias parasitic on man. J. Inf. Dis. **49**: 183 (1931).
(*21*) Ninni, C., and Fittipaldi, C.: Quoted in: Owen, C. R., Anderson, M. B., and Henrici, A. T.: Allergy in *Monilia* and yeast infections. Mycopath. **8**: 10 (1937).
(*22*) Howell, A.: The efficiency of methods for the isolation of *Histoplasma capsulatum*. Pub. Health Rep. **63**: 173 (1948).
(*23*) Howell, A.: Studies of fungus antigens. I. Quantitative studies of cross reactions between histoplasmin and blastomycin in guinea pigs. Pub. Health Rep. **62**: 631 (1947).
(*24*) Conant, N. F.: A cultural study of the life-cycle of *Histoplasma capsulatum*. J. Bact. **41**: 563 (1941).
(*25*) Martin, D. S.: Studies on the immunologic relationships among various species of the genus *Candida* (*Monilia*). Am. J. Trop. Med. **22**: 295 (1942).
(*26*) Emmons, C. W., Bell, J. A., and Olson, B. J.: Naturally occurring histoplasmosis in *Mus musculus* and *Rattus norwegicus*. Pub. Health Rep. **62**: 1642 (1947).

UNITED NATIONS	NATIONS UNIES
WORLD HEALTH	ORGANISATION MONDIALE
ORGANIZATION	DE LA SANTE
INTERIM COMMISSION	COMMISSION INTÉRIMAIRE

EXPERT COMMITTEE ON TUBERCULOSIS

Report of the First Session

Office International d'Hygiène Publique, Paris.

July 30–August 2, 1947

At the third session of the Interim Commission of the World Health Organization held in Geneva in April 1947, it was resolved to set up an Expert Committee on Tuberculosis. The chairman of the Interim Commission and the executive secretary agreed to appoint the following members of this committee, after approaching their respective Governments:

Dr. P. D'Arcy Hart, Medical Research Council, London.

Dr. Herman E. Hilleboe, United States Public Health Service,[1] Washington, D. C.

---

[1] Appointed Commissioner of Health, New York State, July 1, 1947.

Dr. Johannes Holm, State Serum Institute, Copenhagen.

An invitation to the Government of the U. S. S. R. to suggest the name of a Russian member of the committee was sent. The attendance of an expert was arranged, but his sudden illness prevented his coming to Paris.

The Expert Committee on Tuberculosis appointed by the Interim Commission met in Paris from July 30 to August 2, 1947.

Dr. Holm was elected chairman. The Secretary to the Expert Committee, Dr. J. B. McDougall, was in attendance.

The following report of the Committee was accepted by the Interim Commission at its fifth session for submission to the World Health Assembly:

A. *Introduction*

It is recognized that tuberculosis is a world problem of great magnitude. The committee is fully in accord with the decision of the Interim Commission that tuberculosis, malaria, and venereal disease are infectious diseases deserving the highest priorities for its activities.

There can be no isolationism in the field of health. The fight against infectious disease is not a national or a racial problem; it is a task for the whole of humanity. No nation is safe if another nation is vanquished by disease. The fortunate and relatively healthy nations, inspired by intelligent self-interest and humane considerations, will necessarily have to come to the aid of stricken nations, and through money, professional personnel and equipment, distribute existing resources to the needy and suffering areas of the world.

Tuberculosis control work of an international scope must go forward if present suffering and disability are to be alleviated and future generations protected. The all-inclusive objective of any sound tuberculosis program is the prevention and eventual eradication of tuberculosis from the peoples of the world. Poverty, shortages of food and housing, and the lack of opportunity for gainful occupation, complicate the task enormously, and make it necessary for us to share and distribute our resources where they will do the most good in the shortest possible time.

B. *Fields of Activity*

There are five well-defined fields of activity in which we must work and direct our efforts on a planned basis if tuberculosis is to be systematically eliminated: (1) Prevention, (2) case finding, (3) isolation and medical care, (4) rehabilitation and after-care, (5) social and economic protection of afflicted families.

No one of these activities can be effective alone. They all must operate together and in proper sequence.

C. *Techniques for Control*

It is not enough merely to recognize and describe the objectives of a tuberculosis control program. It is also necessary to have clearly defined and firmly established techniques for the achievement of those objectives. The following recommendations include 11 principal techniques for tuberculosis control, which may be used singly, in groups, and finally all together, if the World Health Organization program is to be comprehensive and wholly effective:

1. The first technique is the determination of the extent of the problem of tuberculosis in each country, the present means and facilities of its disposal, the manner in which these facilities are being used to tackle the problem, and the additional facilities needed. Countries with little information available should be encouraged to record at least simple basic data. It is recommended that schedules (now being prepared by the Expert Committee) be filled in by the experts of the Secretariat, who, on request, actually go into the countries. These schedules should be kept up to date at regular intervals.

2. One of the most important techniques that works toward the realization of the objectives of tuberculosis control is the recruitment and training of professional personnel. In most countries there is at present an insufficient number of well-trained workers in this field. It is recommended that traveling fellowships be awarded to countries most in need, principally to train medical officers. There are four special fields in which trained medical officers are essential for every country—administration, epidemiology, laboratory work, and clinical work. It is estimated that one thousand such fellowships could be granted by the World Health Organization with good effect within the next few years. It would appear wise to recommend that only 50 of these be provided in the first year in order to get the program under way. To operate the scheme, the Secretariat should survey the teaching facilities throughout the world and designate acceptable teaching centers. At the same time, the Secretariat should ascertain the needs of countries for trained personnel, so that after such consultation, promising medical officers, especially those who show potentialities of leadership, can be selected for fellowships. Countries where the needs are greatest should be chosen first.

It is also recommended that consultation services of short duration be provided to countries, especially those with teaching centers, in order to make available the latest knowledge and viewpoints of outstanding specialists.

3. The provision of physical facilities, supplies and equipment for all phases of prevention, diagnosis and treatment is second in importance only to the provision for personnel. It is recommended that the World Health Organization should be prepared to give expert advice to the various countries requesting such information, on the

number, type and location of facilities needed, and on the best means of financing the construction and maintenance of these facilities, drawing on the successful experience of other countries. Recommendations should be given only if they are to form a part of a long-range, comprehensive plan for the nation and its administrative subdivisions.

4. Heath education is recognized as an essential tool in tuberculosis control. The general public must know the seriousness of the disease and its cost in human misery and money before it will accept its responsibility to support the work financially. It is recommended that the World Health Organization should encourage national and international voluntary organizations to take the major responsibilities for informing the public and gaining their support.

To keep the medical profession informed on advances in tuberculosis, it is recommended that the World Health Organization prepare from time to time material on recent developments of special importance, and that the circulation of specialist literature be provided. The World Health Organization should encourage national and international professional organizations to develop the distribution of tuberculosis literature.

5. The best way to get a new program started, or to improve a poor one, in any country is by means of field services for the purpose of demonstrating practical activities in one or more of the special fields of administration, epidemiology, laboratory work and clinical work. Well-trained teams, even with limited supplies and equipment, can demonstrate what should be done to control tuberculosis and how to do it. It is recommended that the World Health Organization provide demonstration teams. The size of the team and the length of its stay would vary with needs, but in any event should be kept to a minimum. Certain supplies and equipment will be necessary for these teams. An essential condition for the demonstration will be that the country agrees beforehand to take over the project as soon as sufficient of its personnel has been trained to do so. When taken over, these field demonstrations should become national training centers, and in some cases should be designated also for international use of traveling fellows. For example, an international training center might be established in India for training workers from various parts of Asia, where the problems to be solved are similar in nature. Areas where it is proposed to set up international training centers should have first call on demonstrations, if such are necessary.

The persons charged with these demonstrations could be either regular staff members of the World Health Organization or professional personnel with temporary appointments. The person to take charge of the work, when it is taken over by the local group, could well be one of the persons who had received a traveling fellowship from the World Health Organization.

6. While it is recognized that present budgetary limitations do not permit grants of money for tuberculosis control to nations at this time, it is recommended that in future such grants should be made, in order to help nations unable to help themselves. Such grants should be made, however, only if great need is demonstrated, a complete plan submitted to show the joint use of national funds and those from the World Health Organization, and to show that the funds are used solely for tuberculosis control and that the World Health Organization's contributions are not used to replace local funds.

7. The best contribution that can be made by the World Health Organization in tuberculosis research would appear to be in developing and recommending uniform procedures. Special problems would require from time to time the services of small subcommittees of experts in highly specialized fields. Where possible, members of other expert committees of the World Health Organization should be used for this purpose. Whenever a problem comes up for the Expert Committee on Tuberculosis which involves the responsibility shared by another expert committee, one of the members of the second committee should be asked to take part in the deliberation. For example, when the Expert Committee on Tuberculosis considers the problem of tuberculin and tuberculin testing a member of the Expert Committee on Biological Standardization should be asked to participate, and vice versa. It is recommended that the Committee on International Classification of Morbidity and Mortality consult with the Expert Committee on Tuberculosis before final action is taken on classification of tuberculosis. There are several suggestions our Committee wishes to make on the first draft. The principal problems which need action to establish uniform procedures are as follows:

(1) Tuberculin and tuberculin testing.
(2) Preparation and clinical use of BCG.
(3) Classification of tuberculosis.
(4) X-ray interpretation and mass radiography.
(5) Laboratory diagnosis of tubercle bacilli.
(6) Evaluation of new chemotherapeutic agents such as streptomycin.

Even during the period of the Interim Commission it is recommended that action be taken on (1), (2), and (6). Thus, it is urged that subcommittees be appointed on tuberculin and tuberculin-testing, and on BCG, and that a conference be called early in 1948 on the use and value of streptomycin. This conference should bring together those who have been actively engaged in research on this drug.

8. It is recognized that several other international organizations have been carrying on activities and have contributed in many ways to tuberculosis control. It is recommended that the World Health Organization should take full advantage of these services and should establish working relationships with all groups genuinely interested in tuberculosis control. Such a cooperative effort would help to avoid duplication and would produce harmonious agreement in this collective enterprise. The Committee has been informed that the International Union Against Tuberculosis is about to establish a branch office in Geneva. It is urged that liaison be established at once between World Health Organization and the Union in order that their several activities go forward in unison. Cooperation with all private and official agencies, even those only partially engaged in tuberculosis control activities, should be extended at every opportunity. Furthermore, this Committee would welcome the opportunity to be consulted by other committees of the World Health Organization and United Nations whenever questions and problems involving tuberculosis arise.

9. Tuberculous cattle still form an important source of tuberculosis among human beings throughout the world. Infected milk is not the only source of spread, for it has recently been demonstrated that farm workers may contract bovine tuberculosis through direct contact with diseased cattle. It is recommended that the World Health Organization use its influence to encourage nations whose herds have high infection rates to take active steps to eradicate tuberculosis among cattle as quickly as possible.

10. It is recommended that the World Health Organization be prepared to give expert advice to national governments and health departments on sound laws and regulations pertaining to human and bovine tuberculosis. This committee proposes to study both the legal and epidemiological aspects of the problem of tuberculosis among migrants. This would form the basis of recommendations designed to prevent the spread of this disease from one country to another.

11. Modern public health practice demands that public health programs have review and evaluation at regular intervals, in order that any ineffective techniques may be discarded and that more modern ones be added as new knowledge is gained. This is particularly true of a new program. Accordingly, it is recommended that the World Health Organization make preparation for review and evaluation of its program at yearly intervals with the advice and counsel of the Expert Committee.

D. *Emergency Measures*

Because of the epidemic proportions of tuberculosis in many countries, certain emergency measures, which require relatively small expenditures, should be applied at once. It is recommended that small demonstration teams be sent into such countries, even for short periods, to carry on intensive programs of BCG vaccination similar to those at present in operation under the Danish Red Cross in several European countries which have appealed for aid.

The Committee wishes to emphasize that this measure is clearly of an emergency nature. It is hoped that the initiation and successful operation will encourage the local groups to develop and carry on a more comprehensive program.

E. *Tuberculosis Secretariat and Finance*

In order to accomplish the above proposals, it is recommended that a permanent Tuberculosis Control Office be established within the World Health Organization.

Even though no funds are available yet for all these proposals, which the Committee hopes the World Health Organization will in due course accept, it is recommended that some funds be provided immediately by the Interim Commission for the emergency measure under heading D, namely, to start in certain countries, as soon as possible, programs for BCG vaccination and for identifying infectious cases.

It is further recommended that the Interim Commission provide immediate funds for the expenses of the subcommittee meetings (on tuberculin and tuberculin testing, and on BCG) and for the conference on streptomycin, referred to under heading C7.

F. *Dissemination of Information*

If the World Health Organization Interim Commission approves of the proposals of this Committee, it is recommended that there should be wide dissemination of information concerning the services the World Health Organization can provide.

INCIDENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

February 29–March 27, 1948

The accompanying table summarizes the incidence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in PUBLIC HEALTH REPORTS under the section "Incidence of Disease." The table gives the number of cases of these diseases for the 4 weeks ended March 27, 1948, the number reported for the corresponding period in 1947, and the median number for the years 1943–47.

DISEASES ABOVE MEDIAN INCIDENCE

Influenza.—The number of cases of influenza dropped from 45,536 during the preceding 4 weeks to 25,459 during the 4 weeks ended March 27. Of the total cases, Texas reported 11,620, South Carolina 2,825, Virginia 2,213, Alabama 1,512, California, 1,447, Arkansas 985, and Arizona 834; 84 percent of the cases occurred in those 7 States. For the country as a whole the incidence was only about 20 percent of the 1947 incidence for the corresponding weeks, but it was 1.4 times the median for the preceding 5 years. The recent outbreak of this disease that has been confined to States in the Southern and Western sections followed the usual pattern of an influenza epidemic and the peak apparently was reached during the month of February. The 1947 epidemic did not begin until late in the season and the peak was not reached until in March, or during the 4 weeks corresponding to the period under consideration.

DISEASES BELOW MEDIAN INCIDENCE

Diphtheria.—The incidence of diphtheria continued to decline. For the 4 weeks ended March 27 there were 732 cases reported as compared with a median of 1,067 cases for the corresponding period in the preceding 5 years (1943–47). In the South Atlantic and Mountain sections the incidence was somewhat above normal, but in all other sections the numbers of cases were relatively low. For the country as a whole the current incidence was the lowest in the 20 years for which data are available in this form.

Measles.—For the current 4-week period there were 83,160 cases of measles reported. The number was more than 3 times that reported for the corresponding period in 1947, but it was slightly below the median for the preceding 5 years. The disease was most prevalent in the East North Central and West South Central sections; in the former section the number of cases (29,760) was 2.1 times the 1943–47 median and in the latter section the number of cases (8,364) was 1.5 times the normal seasonal median. A slight increase was reported from the Pacific section but in the other 6 sections the incidence was considerably below the expected seasonal incidence.

Meningococcus meningitis.—The incidence of meningococcus meningitis (352 cases) was the lowest reported for this period since 1942 when 329 cases were reported for the corresponding 4 weeks. The New England, South Atlantic, and Pacific sections reported more cases than occurred during the same weeks in 1947, but the incidence in all sections was considerably below the median for the preceding 5 years. However, since the 1943–47 median fell within an epidemic period of this disease a better comparison is with the average incidence for nonepidemic years which is approximately 300 cases.

Poliomyelitis.—The number of cases (110) of poliomyelitis reported during the 4 weeks ended March 27 compared very favorably with the median for the preceding 5 years (112 cases). The median for this disease also falls within an epidemic period and, while the current incidence is about the same as the median, the number of cases is still higher than the average of 80 cases for nonepidemic years. While the numbers of cases were not large in the West North Central and Mountain sections (16 and 15, respectively) they were more than twice the medians for those sections. Minor increases were reported from 3 other sections and in the other 4 sections the incidence was lower than the median.

Scarlet fever.—The incidence of scarlet fever continued at a relatively low level, the current incidence (10,546 cases) being about 85 percent of the 1947 incidence for the corresponding period and 61 percent of the median for the preceding 5 years. While each section of the country has shared in the favorable situation for this disease that now exists, the greatest declines from the normal incidence during this particular 4-week period occurred in the New England, South Atlantic, and Mountain sections. Since 1944 this disease has been on the downward swing of a long-term cycle and for the current 4-week period the incidence was the lowest on record.

Smallpox.—Eight cases of smallpox were reported during the 4 weeks ended March 27, as compared with 19 in 1947 and a median for the preceding 5 years of 39 cases. Three cases occurred in Kansas and one each in Minnesota, North Dakota, North Carolina, Georgia, and Oklahoma. The number of cases was the lowest on record for these same weeks.

Typhoid and paratyphoid fever.—For these diseases the incidence (166 cases) during the 4 weeks ended March 27 was the lowest for a corresponding period in the 20 years for which these data are available. A few more cases than might be expected occurred in the West North Central and West South Central sections, but in other sections the incidence was about equal to or lower than the seasonal expectancy. The greatest declines were reported from the North Atlantic and East North Central sections.

Whooping cough.—The incidence of this disease was also relatively low, the 9,485 cases reported being less than 90 percent of the median for the preceding 5 years. Of the 9 geographic sections, 4 reported an increase over the normal seasonal median and in 5 sections the incidence was lower than the expectancy. The greatest increase in cases was reported from the West South Central sections and the greatest decline occurred in the Middle Atlantic section.

MORTALITY, ALL CAUSES

For the 4 weeks ended March 27 there were 39,148 deaths from all causes reported to the National Office of Vital Statistics by 93 large cities. The median number of deaths for the corresponding period in the years 1945–47 was 38,603. The number of deaths was higher than the preceding 3-year median in each week of the current 4 weeks except the first one and for the 4 weeks the number was 1.4 percent above the median.

Number of reported cases of 9 communicable diseases in the United States during the 4-week period February 29–March 27, 1948, the number for the corresponding period in 1947, and the median number of cases reported for the corresponding period, 1943–47

Division	Current period	1947	5-year median	Current period	1947	5-year median	Current period	1947	5-year median
	Diphtheria			Influenza[1]			Measles		
United States	732	1,068	1,067	25,459	125,077	17,615	83,160	27,064	87,789
New England	24	85	40	37	52	83	3,773	6,787	6,787
Middle Atlantic	77	131	131	166	90	90	16,981	4,608	21,783
East North Central	99	145	142	312	2,620	710	29,760	4,568	13,993
West North Central	76	111	111	246	17,063	183	5,648	639	7,371
South Atlantic	152	138	138	5,574	15,939	4,540	4,488	4,526	5,222
East South Central	67	121	108	2,111	3,933	1,391	2,098	1,195	3,863
West South Central	88	164	204	13,462	76,571	6,921	8,364	2,161	5,634
Mountain	92	55	52	1,472	7,751	1,144	3,397	1,398	4,969
Pacific	57	118	118	2,079	1,058	553	8,651	1,182	8,469
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	352	372	1,018	110	156	112	10,546	12,272	16,287
New England	18	11	45	1	6	6	924	879	2,361
Middle Atlantic	58	70	239	14	12	12	2,964	3,112	4,844
East North Central	51	52	199	12	18	9	3,480	4,085	4,413
West North Central	22	42	70	16	16	7	834	1,082	1,718
South Atlantic	52	44	158	13	14	14	671	818	1,522
East South Central	39	39	93	9	12	8	289	553	553
West South Central	51	64	101	11	22	17	274	313	465
Mountain	7	8	13	15	7	7	326	498	848
Pacific	54	42	111	19	49	23	784	932	1,054
	Smallpox			Typhoid and paratyphoid fever			Whooping cough		
United States	8	19	39	166	189	198	9,485	10,709	10,667
New England	0	0	0	6	15	13	780	1,002	1,168
Middle Atlantic	0	0	0	21	20	33	1,369	1,984	1,984
East North Central	0	5	6	15	29	29	1,661	2,451	1,569
West North Central	5	8	9	14	10	10	464	345	377
South Atlantic	2	1	2	37	30	38	1,232	1,384	1,521
East South Central	0	1	5	15	15	16	404	427	435
West South Central	1	2	11	37	30	34	2,172	2,006	1,196
Mountain	0	2	2	8	8	9	645	237	399
Pacific	0	0	2	13	32	20	758	873	873

[1] New York, North Carolina, and Pennsylvania excluded; New York City and Philadelphia included.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED APRIL 17, 1948

Summary

A total of 32 cases of poliomyelitis (the same number as for the corresponding week last year) was reported for the current week, as compared with 37 last week and a 5-year (1943–47) median of 28. Only 2 States reported more than 2 cases—Texas 6 (last week 9), and Michigan 3 (last week 2). The total reported for the 4 weeks since the average date of seasonal low incidence is 120 cases, as compared with 124 for the same period in 1945, the highest number reported for a corresponding period of the past 5 years, 68 in 1944 the lowest, and a 5-year median for the period of 108 cases, reported in 1946.

For the current week, 25,616 cases of measles was reported, as compared with 25,842 last week (the highest incidence so far this year) and a 5-year median of 27,161. In 1946 the peak of incidence was reached in the week ended April 13 with a reported total of 40,746 cases. The total for the year to date is 250,733, as compared with 82,918 for the same period last year and 262,946 for the 5-year median.

Of the total of 2,044 reported cases of influenza (last week 2,702, corresponding week last year 23,536, 5-year median 1,917), 1,514 cases were reported in 4 States—Texas 879, South Carolina 283, Virginia 246, and Oklahoma 106.

Four cases of Rocky Mountain spotted fever were reported, 1 each in New Jersey, Wyoming, Colorado, and Oregon. New York reported 2 cases of anthrax, and New Jersey 1 case. One case of smallpox was reported, in Nebraska, and 1 case of psittacosis, in Michigan.

During the week 8,942 deaths from all causes were recorded in 92 large cities in the United States, as compared with 9,601 last week, 9,670 and 9,051 respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 9,078. The total for the year to date is 160,698, as compared with 160,962 for the corresponding period last year. Infant deaths in the same cities totaled 655, as compared with 707 last week and a 3-year median of 631. The cumulative total is 11,006, as compared with 12,738 for the same period in 1947.

Telegraphic morbidity reports from State health officers for the week ended Apr. 17, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended— Apr. 17, 1948	Week ended— Apr. 12, 1947	Median 1943–47	Week ended— Apr. 17, 1948	Week ended— Apr. 12, 1947	Median 1943–47	Week ended— Apr. 17, 1948	Week ended— Apr. 12, 1947	Median 1943–47	Week ended— Apr. 17, 1948	Week ended— Apr. 12, 1947	Median 1943–47
NEW ENGLAND												
Maine	0	0	0	-------	4	2	6	250	91	0	0	0
New Hampshire	0	0	0	-------	8	0	17	9	9	0	0	1
Vermont	0	0	0	-------	15	0	5	285	156	0	0	0
Massachusetts	2	9	8	-------	-------	0	1,373	360	1,013	2	1	5
Rhode Island	0	1	0	-------	-------	1	9	206	14	0	0	1
Connecticut	3	0	0	3	9	3	146	864	430	0	1	3
MIDDLE ATLANTIC												
New York	2	12	14	[1] 6	[1] 18	[1] 2	2,252	532	2,317	6	6	17
New Jersey	3	3	6	3	16	7	1,165	451	1,831	1	1	10
Pennsylvania	2	17	12	(2)	[2] 4	[2] 2	1,587	283	898	3	7	13
EAST NORTH CENTRAL												
Ohio	5	10	13	1	32	14	1,098	582	916	3	13	13
Indiana	10	4	3	-------	17	7	668	120	224	0	0	5
Illinois	5	4	15	2	16	16	1,805	92	1,281	2	16	16
Michigan [3]	1	4	8	-------	11	1	1,479	69	812	2	7	7
Wisconsin	1	4	3	1	290	36	1,891	326	2,277	1	2	4
WEST NORTH CENTRAL												
Minnesota	2	2	2	-------	3	2	462	96	96	0	4	4
Iowa	0	0	4	-------	1,576	-------	359	181	181	1	2	2
Missouri	2	25	4	17	7	3	550	6	73	3	3	5
North Dakota	0	0	0	-------	2	2	16	7	8	0	1	0
South Dakota	0	1	1	-------	-------	-------	45	12	38	0	0	0
Nebraska	1	2	1	7	-------	1	244	8	166	0	1	1
Kansas	1	4	3	-------	72	5	88	4	623	2	0	3
SOUTH ATLANTIC												
Delaware	0	0	0	-------	-------	-------	42	-------	12	0	1	1
Maryland [3]	7	14	6	5	11	6	145	23	168	1	5	10
District of Columbia	0	0	0	-------	-------	1	169	44	83	0	2	2
Virginia	1	4	4	246	4,673	274	145	288	488	4	3	8
West Virginia	2	4	4	11	935	12	324	22	116	0	3	8
North Carolina	6	6	6	-------	-------	-------	16	221	221	2	5	8
South Carolina	2	9	5	283	2,650	292	77	210	251	2	0	1
Georgia	4	5	1	19	485	43	39	155	216	0	0	4
Florida	5	2	3	35	109	16	269	127	127	0	1	3
EAST SOUTH CENTRAL												
Kentucky	2	8	5	5	-------	4	179	3	81	3	3	7
Tennessee	4	5	5	44	741	43	212	96	286	1	3	3
Alabama	2	1	7	95	727	87	61	188	235	0	5	5
Mississippi [3]	3	3	5	16	118	-------	56	16	-------	1	1	3
WEST SOUTH CENTRAL												
Arkansas	0	3	2	73	1,255	35	82	113	193	1	2	2
Louisiana	3	2	2	5	300	16	74	26	84	1	0	2
Oklahoma	4	3	3	106	3,347	79	58	11	51	1	1	2
Texas	12	18	29	879	3,896	778	2,927	374	1,297	1	10	10
MOUNTAIN												
Montana	3	0	1	2	571	4	28	162	124	0	0	0
Idaho	0	0	0	21	63	2	121	12	67	0	0	0
Wyoming	0	0	0	1	-------	-------	116	19	60	0	0	1
Colorado	3	9	4	22	641	25	641	93	225	1	0	0
New Mexico	4	0	0	8	7	2	35	77	24	0	0	0
Arizona	2	8	2	36	165	78	224	81	81	0	0	1
Utah [3]	0	1	0	1	98	3	205	13	164	0	0	0
Nevada	0	0	0	-------	-------	-------	-------	-------	11	0	0	0
PACIFIC												
Washington	0	2	5	4	480	3	761	28	133	1	2	3
Oregon	0	1	7	34	85	13	[4] 87	27	134	0	0	1
California	7	20	20	53	79	29	3,258	178	1,536	3	10	22
Total	116	230	244	2,044	23,536	1,917	25,616	7,350	27,161	49	122	194
15 weeks	2,976	4,231	4,231	126,054	266,137	179,321	[4] 250,733	82,918	262,946	1,249	1,322	3,617
Seasonal low week [5]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	9,334	11,797	12,888	169,612	299,112	299,112	[4] 285,679	105,805	300,959	2,031	2,294	6,069

[1] New York City only. [2] Philadelphia only. [3] Period ended earlier than Saturday.

[4] 69 additional cases reported in Arizona for week ended April 3—included in cumulative totals only.

[5] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended Apr. 17, 1948, and comparison with corresponding week of 1947 and 5-year median—Continued

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943–47	Week ended		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	Apr. 17, 1948	Apr. 12, 1947		Apr. 17, 1948	Apr. 12, 1947		Apr. 17, 1948	Apr. 12, 1947		Apr. 17, 1948 [7]	Apr. 12, 1947	
NEW ENGLAND												
Maine	0	1	0	[6] 5	21	34	0	0	0	4	0	0
New Hampshire	0	0	0	0	9	8	0	0	0	0	0	0
Vermont	0	0	0	5	10	10	0	0	0	0	0	0
Massachusetts	0	0	0	182	115	366	0	0	0	5	6	1
Rhode Island	0	0	0	5	16	22	0	0	0	1	0	0
Connecticut	0	0	0	18	42	71	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	2	7	4	[6] 269	343	535	0	7	0	1	0	0
New Jersey	1	2	1	67	155	155	0	0	0	0	0	0
Pennsylvania	0	0	1	308	216	405	0	0	0	3	4	4
EAST NORTH CENTRAL												
Ohio	1	0	0	311	358	358	0	0	1	4	2	1
Indiana	1	0	0	30	71	105	0	1	1	1	2	2
Illinois	0	1	1	107	103	203	0	0	1	1	0	2
Michigan [3]	3	1	1	123	128	160	0	0	0	2	2	2
Wisconsin	0	0	0	69	39	168	0	0	0	0	1	0
WEST NORTH CENTRAL												
Minnesota	2	0	0	29	48	71	0	0	0	0	0	0
Iowa	0	0	0	26	40	57	0	0	0	0	1	0
Missouri	2	0	0	[6] 33	38	56	0	0	0	1	0	0
North Dakota	0	0	0	3	7	8	0	0	0	1	0	0
South Dakota	0	0	0	1	10	19	0	0	0	0	0	0
Nebraska	2	0	0	17	13	38	1	0	0	0	0	0
Kansas	0	0	0	25	43	72	0	0	0	1	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	3	7	7	0	0	0	0	0	0
Maryland [3]	0	0	0	[6] 34	28	148	0	0	0	3	0	0
District of Columbia	0	0	0	8	8	24	0	0	0	1	0	0
Virginia	0	0	0	21	32	82	0	0	0	8	0	1
West Virginia	0	0	0	13	11	39	0	0	0	1	0	0
North Carolina	2	0	0	19	20	39	0	0	0	1	0	0
South Carolina	0	0	0	2	2	3	0	0	0	0	0	0
Georgia	2	0	0	17	14	14	0	0	0	2	1	1
Florida	1	2	1	6	13	10	0	0	0	2	1	1
EAST SOUTH CENTRAL												
Kentucky	0	3	0	10	26	38	0	0	0	1	2	2
Tennessee	0	1	0	20	42	38	0	0	0	2	0	1
Alabama	0	0	1	6	6	16	0	0	0	1	0	0
Mississippi [3]	0	1	1	2	4	10	0	1	0	1	0	0
WEST SOUTH CENTRAL												
Arkansas	0	0	0	4	5	6	0	0	0	2	0	0
Louisiana	0	0	0	4	4	7	0	0	0	2	4	4
Oklahoma	1	2	0	9	7	16	0	0	0	0	0	0
Texas	6	0	3	29	31	63	0	0	1	5	1	7
MOUNTAIN												
Montana	0	0	0	22	3	15	0	0	0	0	0	0
Idaho	1	0	0	[6] 14	7	28	0	0	0	0	0	0
Wyoming	0	0	0	2	2	22	0	0	0	0	0	0
Colorado	0	0	0	15	43	45	0	0	0	0	2	1
New Mexico	0	0	0	4	11	11	0	0	0	0	0	1
Arizona	0	0	0	6	11	13	0	0	0	0	0	2
Utah [3]	0	0	0	16	15	30	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	2	1	1	53	28	44	0	0	0	0	0	0
Oregon	1	0	0	12	47	41	0	0	0	0	1	1
California	2	10	5	104	129	201	0	0	0	1	2	2
Total	32	32	28	2,088	2,381	4,483	1	9	10	58	32	53
15 weeks	468	721	521	34,969	40,604	59,767	37	77	160	689	641	802
Seasonal low week [5]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	120	109	108	57,508	67,290	98,088	58	131	243	216	156	210

[3] Period ended earlier than Saturday.

[5] Dates between which the approximate low week ends. The specific date will vary from year to year.

[6] Including cases reported as streptococcal sore throat.

[7] Including paratyphoid fever reported separately, as follows: Massachusetts 4 (salmonella infection), Virginia 1, Tennessee 1, California 1.

Telegraphic morbidity reports from State health officers for the week ended Apr. 17, 1948, and comparison with corresponding week of 1947 and 5-year median—Continued

Division and State	Whooping cough: Week ended— Apr. 17, 1948	Whooping cough: Week ended— Apr. 12, 1947	Whooping cough: Median 1943-47	Week ended Apr. 17, 1948: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	11	19	19		39						
New Hampshire	1										
Vermont	59	15	15								1
Massachusetts	47	124	124		1		1				
Rhode Island	1	5	18								
Connecticut	25	36	36	1			1				2
MIDDLE ATLANTIC											
New York	101	115	163	16	3						6
New Jersey	64	129	124	2				1			
Pennsylvania	62	163	161								[8] 2
EAST NORTH CENTRAL											
Ohio	74	144	133	1							7
Indiana	35	48	35								2
Illinois	40	54	54	5	6						17
Michigan [3]	85	148	93	14							2
Wisconsin	110	127	104						1		12
WEST NORTH CENTRAL											
Minnesota	26	23	10	2							4
Iowa	11	10	11								7
Missouri	30	20	11								1
North Dakota	9		2	1							
South Dakota	7	1	1								
Nebraska	3	6	6								
Kansas	45	18	28						1		10
SOUTH ATLANTIC											
Delaware		3	1								
Maryland [3]	20	58	58			2					2
District of Columbia	7	7	7	1							
Virginia	36	84	84			48					
West Virginia	16	10	26								
North Carolina	99	13	94		1				1	2	
South Carolina	81	108	79	1	3		1			1	1
Georgia	18	30	30	1	1				3		3
Florida	28	48	24	4							
EAST SOUTH CENTRAL											
Kentucky	7	9	34								
Tennessee	42	25	29	1		1					1
Alabama	40	38	18	1						1	
Mississippi [3]		5		1	1						
WEST SOUTH CENTRAL											
Arkansas	23	17	11	16		2			2		2
Louisiana	11	20	3	2					4		1
Oklahoma	39	13	10								1
Texas	502	583	351	14	402	33				2	8
MOUNTAIN											
Montana	6	1	2								
Idaho	6	10	6								
Wyoming	6		2					1			
Colorado	56	33	33					1			7
New Mexico	21	21	7			2					
Arizona	68	12	18			6					1
Utah [3]	18	6	33								
Nevada											
PACIFIC											
Washington	33	18	27	1		2					1
Oregon	23	10	18	9				1			3
California	97	141	141	6	4						3
Total	2,149	2,528	2,528	100	461	96	3	4	12	6	107
Same week: 1947	2,528			42	187	146	8	1	14	86	99
Median, 1943-47	2,528			36	261	74	8	2	13	36	[9] 99
15 weeks: 1948	32,906			997	3,977	2,852	129	10	266	206	1,369
1947	38,015			697	4,612	3,171	101	13	525	614	1,564
Median, 1943-47	36,627			441	4,252	1,547	119	6	267	692	[9] 1,287

[3] Period ended earlier than Saturday.

[8] 9 cases undulant fever reported in February and March in error; deducted from cumulative totals.

Alaska: Chickenpox 3, measles 1, influenza 2, mumps 1, pneumonia 2, whooping cough 25. Territory of Hawaii: Rabies 0, measles 5, scarlet fever 3, typhus fever (endemic) 2, whooping cough 44. *Anthrax:* New York 2, New Jersey 1. *Leprosy:* Florida 2. *Psittacosis:* Michigan 1.

[9] 3-year median, 1945–47.

WEEKLY REPORTS FROM CITIES*

City reports for week ended Apr. 10, 1948

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	2	0	2	0	3	0	0	------
New Hampshire:												
Concord	0	0	------	0	3	0	2	0	1	0	0	------
Massachusetts:												
Boston	1	0	------	0	493	0	9	0	55	0	0	9
Fall River	0	0	------	0	5	0	1	0	1	0	0	3
Springfield	0	0	------	0	1	0	0	0	3	0	0	------
Worcester	0	0	------	0	------	0	14	0	11	0	0	2
Rhode Island:												
Providence	0	0	2	1	1	0	3	0	4	0	0	------
Connecticut:												
Bridgeport	0	0	------	0	------	0	0	0	2	0	0	------
Hartford	0	0	------	0	------	0	0	0	2	0	0	------
New Haven	0	0	------	0	2	0	3	0	2	0	0	3
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	13	1	1	0	7	0	0	5
New York	8	0	4	1	1,544	5	79	0	56	0	0	21
Rochester	0	0	------	0	3	0	2	0	10	0	0	------
Syracuse	0	0	------	0	3	0	3	0	5	0	0	6
New Jersey:												
Camden	1	0	------	0	14	0	0	0	1	0	0	------
Newark	0	0	1	1	167	0	0	0	5	0	0	------
Trenton	1	0	------	0	4	1	4	0	1	0	0	4
Pennsylvania:												
Philadelphia	3	0	2	0	703	0	17	0	41	0	0	19
Pittsburgh	0	0	1	1	8	1	9	1	26	0	0	6
Reading	0	0	------	0	9	0	8	0	14	0	0	3
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	1	0	------	1	87	2	6	0	11	0	0	3
Cleveland	0	0	1	1	16	1	9	0	38	0	0	13
Columbus	0	0	------	0	57	0	2	0	6	0	0	2
Indiana:												
Fort Wayne	0	0	------	0	23	0	2	0	2	0	0	------
Indianapolis	1	0	------	0	179	0	2	0	7	0	0	12
South Bend	0	0	------	0	6	0	0	0	2	0	0	------
Terre Haute	0	0	------	0	------	0	2	0	0	0	0	1
Illinois:												
Chicago	1	0	------	0	977	3	24	0	48	0	0	11
Springfield	0	0	------	0	12	0	3	0	1	0	0	------
Michigan:												
Detroit	2	0	------	0	298	1	8	0	49	0	0	19
Flint	0	0	------	0	------	0	1	0	4	0	0	------
Grand Rapids	0	0	------	0	57	0	2	0	1	0	0	2
Wisconsin:												
Kenosha	0	0	------	0	78	0	0	0	0	0	0	------
Milwaukee	0	0	------	0	48	0	3	0	18	0	0	2
Racine	0	0	------	0	111	0	0	0	3	0	0	9
Superior	2	0	------	0	188	0	0	0	0	0	0	1
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	329	0	0	0	4	0	0	------
Minneapolis	0	0	------	0	37	1	2	0	9	0	0	1
St. Paul	0	0	------	0	67	0	4	0	9	0	0	8
Missouri:												
Kansas City	0	0	7	0	38	1	9	0	1	0	1	10
St. Joseph	0	0	------	0	1	0	0	0	1	0	0	------
St. Louis	5	0	1	0	320	0	13	0	8	0	1	12

* In some instances the figures include nonresident cases.

City reports for week ended Apr. 10, 1948—Continued

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet-fever cases	Smallpox cases	Typhoid- and paratyphoid-fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	0	95	0	4	0	1	0	0	------
Kansas:												
Topeka	0	0	------	0	15	0	1	0	0	0	0	2
Wichita	0	0	------	0	6	0	4	0	2	0	0	2
SOUTH ATLANTIC												
Deleware:												
Wilmington	0	0	------	0	30	0	1	0	2	0	0	------
Maryland:												
Baltimore	2	0	1	1	56	1	13	0	9	0	0	7
Cumberland	0	0	------	0	------	0	0	0	0	0	1	------
Frederick	1	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	123	2	5	0	5	0	0	5
Virginia:												
Lynchburg	0	0	------	0	------	0	0	0	0	0	0	3
Richmond	1	0	------	0	1	0	6	0	3	0	0	3
Roanoke	0	0	------	0	3	0	0	0	0	0	0	------
West Virginia:												
Charleston	0	0	------	0	3	0	1	0	1	0	0	------
Wheeling	0	0	------	0	11	0	0	0	1	0	0	1
North Carolina:												
Raleigh	0	0	------	0	1	0	0	0	0	0	0	------
Wilmington	0	0	------	0	------	0	0	0	1	0	0	5
Winston-Salem	0	0	------	0	------	1	2	2	0	0	0	3
South Carolina:												
Charleston	0	0	4	0	1	0	0	0	2	0	0	9
Georgia:												
Atlanta	1	0	2	1	2	0	2	0	2	0	0	1
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Savannah	0	0	------	0	------	0	2	0	1	0	0	1
Florida:												
Tampa	0	0	------	0	8	1	2	0	3	0	0	1
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	4	1	166	0	8	0	8	0	0	1
Nashville	0	0	------	0	6	0	1	0	6	0	0	3
Alabama:												
Birmingham	0	0	1	0	1	0	2	0	3	0	0	2
Mobile	0	0	------	0	------	0	1	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	5	0	2	0	2	0	0	0	0	1
Louisiana:												
New Orleans	2	0	1	1	------	2	5	0	1	0	1	------
Shreveport	0	0	------	0	------	0	1	0	1	0	0	------
Oklahoma:												
Oklahoma City	0	0	------	1	7	0	5	0	1	0	0	2
Texas:												
Dallas	0	1	------	0	131	0	2	0	6	0	0	1
Galveston	0	0	------	0	7	0	0	0	0	0	0	------
Houston	0	0	------	0	2	0	8	0	0	0	1	1
San Antonio	1	0	3	2	29	0	6	1	0	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	------	0	1	0	0	0	0	------
Great Falls	0	0	------	0	3	0	2	0	4	0	0	------
Helena	0	0	------	0	------	0	0	0	0	0	0	------
Missoula	0	0	------	0	------	0	0	0	1	0	0	------
Idaho:												
Boise	0	0	------	0	------	0	3	0	0	0	0	------
Colorado:												
Denver	1	0	1	0	309	0	5	0	2	0	0	17
Pueblo	0	0	------	0	16	0	1	0	6	0	0	5
Utah:												
Salt Lake City	0	0	------	1	19	0	3	0	3	0	0	1

City reports for week ended Apr. 10, 1948—Continued

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	88	0	3	0	6	0	0	4
Spokane	0	0	------	0	3	0	2	0	2	0	0	------
Tacoma	0	0	------	0	21	0	0	0	0	0	0	------
California:												
Los Angeles	1	0	16	1	191	1	0	2	20	0	1	14
Sacramento	0	0	------	0	28	0	0	0	2	0	0	4
San Francisco	0	0	7	0	356	0	5	0	9	0	0	7
Total	36	1	64	15	7,589	25	353	6	586	0	6	293
Corresponding week, 1947 [1]	63	------	796	69	1,393	------	480	------	693	0	12	523
Average 1943-47 [1]	69	------	208	[2] 32	[3] 7,201	------	[2] 405	------	1,576	1	12	635

[1] Exclusive of Oklahoma City.
[2] 3-year average 1945-47.
[3] 5-year median 1943-47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (latest available estimated population, 34,593,800)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Tyhpoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	2.6	0.0	5.3	2.6	1,331	0.0	89.3	0.0	221	0.0	0.0	45
Middle Atlantic	6.0	0.0	3.7	1.4	1,142	3.7	54.6	0.5	77	0.0	0.0	30
East North Central	4.3	0.0	0.6	1.2	1,299	4.3	38.9	0.0	116	0.0	0.0	46
West North Central	10.1	0.0	16.1	0.0	1,826	4.0	74.4	0.0	70	0.0	4.0	70
South Atlantic	8.2	0.0	11.4	3.3	391	8.2	55.6	3.3	49	0.0	1.6	64
East South Central	0.0	0.0	29.5	5.9	1,021	0.0	70.8	0.0	100	0.0	0.0	35
West South Central	7.6	2.5	22.9	10.2	452	5.1	73.7	2.5	23	0.0	5.1	18
Mountain	7.9	0.0	7.9	7.9	2,756	0.0	119.1	0.0	127	0.0	0.0	183
Pacific	1.6	0.0	36.4	1.6	1,000	1.6	15.8	3.2	62	0.0	1.6	46
Total	5.4	0.2	9.7	2.3	1,147	3.8	53.4	0.9	89	0.0	0.9	44

Dysentery, amebic.—Cases: Memphis 1, New Orleans 1, Los Angeles 4, San Francisco 1.
Dysentery, bacillary.—Cases: Worcester 3, St. Louis 1, Los Angeles 2.
Dysentery, unspecified.—Cases: San Antonio 1.
Tularemia.—Cases: New Orleans 1, San Antonio 1.
Typhus fever, endemic.—Cases: New York 2, Tampa 1.

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—February 1948.—During the month of February 1948, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Residence [1]									
	Panama City		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	7				2		1		10	
Diphtheria	11				1		1		13	
Dysentery:										
Amebic							1		1	
Bacillary					8				8	
Malaria [2]	1		2		6		148	1	157	1
Measles	3						13		16	
Meiningitis, meningococcus					1				1	
Pneumonia		9		2	17	2		4	[3] 17	17
Poliomyelitis					4		2		6	
Relapsing fever	1								1	
Tuberculosis		17		9	2	3		7	[3] 2	36
Typhoid fever	1		1				2		4	

[1] If place of infection is known, cases are so listed instead of by residence.
[2] 16 recurrent cases.
[3] Reported in the Canal Zone only.

DEATHS DURING WEEK ENDED APR. 10, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Apr. 10, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	9, 690	10, 154
Median for 3 prior years	9, 154	
Total deaths, first 15 weeks of year	152, 347	151, 812
Deaths under 1 year of age	714	723
Median for 3 prior years	599	
Deaths under 1 year of age, first 15 weeks of year	10, 422	12, 075
Data from industrial insurance companies:		
Policies in force	71, 084, 296	67, 308, 805
Number of death claims	15, 613	12, 738
Death claims per 1,000 policies in force, annual rate	11. 5	9. 9
Death claims per 1,000 policies, first 15 weeks of year, annual rate	10. 3	9. 9

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—During the weeks ended March 20 and 27, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Week ended March 20, 1948.—

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		42		196	345	48	12	43	85	771
Diptheria				10				5		15
Dysentery, bacillary				2					1	3
German measles				73	21	1	2	7	6	110
Influenza		41			20	1			19	81
Measles			1	881	1,276	2	7	15	146	2,328
Meningitis, meningococcus			1	1	2	1				5
Mumps		23		283	343	47	66	47	22	831
Poliomyelitis								1		1
Scarlet fever			2	47	82	4		5	36	176
Tuberculosis (all forms)		3	4	87	37	30	9	3	36	209
Typhoid and paratyphoid fever				15			1	1		17
Undulant fever				1	2		1	1	1	6
Venereal diseases:										
Gonorrhea	4	17	7	75	69	33	18	33	73	329
Syphilis	1	13	7	85	34	8	9	8	22	187
Other forms									1	1
Whooping cough				25	26	2	1	55	5	114

Week ended March 27, 1948.-

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		34	3	171	264	60	20	13	89	654
Diphtheria		1	1	8			1	1		12
Dysentery, bacillary				1						1
German measles				9	18			2	12	41
Influenza		14			16				34	64
Measles				797	1,231	4	6	13	61	2,112
Meningitis, meningococcus						1				1
Mumps		23	1	205	288	25	65	32	10	649
Scarlet fever		1	2	34	67	1	4	4	6	119
Tuberculosis (all forms)		4	6	52	31	13	5	60	53	224
Typhoid and paratyphoid fever				9		1			1	11
Undulant fever									2	2
Venereal diseases:										
Gonorrhea		8	9	98	84	30	18	45	40	332
Syphilis		6	10	76	28	8	11	2	12	153
Whooping cough				26	15	3		33	5	82

MADAGASCAR

Madagascar and Comoro Islands—Notifiable diseases—January and February 1948.—Notifiable contagious diseases were reported in Madagascar and Comoro Islands during January and February 1948 as follows:

	January				February			
	Aliens		Natives		Aliens		Natives	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Beri-beri	0	0	20	0	1	0	9	1
Bilharziasis	1	0	86	0	0	0	114	0
Cerebrospinal meningitis	0	0	9	1	0	0	12	7
Diphtheria	2	0	8	2	3	0	2	1
Dysentery amebic	23	0	400	11	20	0	598	14
Dysentery, bacillary	0	0	21	0	2	0	11	0
Erysipelas	1	0	10	1	0	0	18	1
Influenza	4	0	2,330	28	5	0	2,247	25
Leprosy	0	0	52	0	0	0	25	0
Malaria	471	7	41,644	374	564	4	41,906	369
Measles	2	0	57	2	1	0	39	0
Mumps	2	0	254	0	0	0	182	0
Plague	0	0	61	41	0	0	46	29
Pneumonia, broncho	3	2	295	57	5	4	308	38
Pneumonia, pneumococcic	5	1	419	79	2	1	293	58
Poliomyelitis	0	0	0	0	0	0	2	0
Puerperal infection	0	0	4	1	0	0	8	0
Relapsing fever	0	0	0	0	1	0	0	0
Scarlet fever	1	0	0	0	1	0	0	0
Trachoma	0	0	1	0	1	0	0	0
Tuberculosis, pulmonary	3	1	129	36	11	3	113	29
Typhoid and paratyphoid fever	1	0	48	12	3	1	30	6
Whooping cough	6	0	82	0	2	0	88	0

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

India—Calcutta.—For the week ended April 3, 1948, 282 cases of cholera were reported in Calcutta, India.

Indochina (French)—*Cochinchina—Rachgia.*—During the period March 1–20, 1948, 58 cases of cholera with 23 deaths were reported in Rachgia, Cochinchina French Indo-China.

Plague

Belgian Congo—Stanleyville Province.—During the week ended April 3, 1948, 1 fatal case of plague was reported in the area northeast of Blukwa in Stanleyville Province, Belgian Congo.

British East Africa—Tanganyika—Central Province.—During the months of February and March 1948, 189 cases of plague with 85 deaths were reported in Singida District, Central Province, Tanganyika, British East Africa.

China—Kiangsi Province—Nanchang.—Information dated April 15, 1948, states that the usual spring epidemic of plague has re-appeared in Nanchang, Kiangsi Province, China. The epidemic is reported under control, but travelers have been advised to be innoculated.

India—Lucknow.—For the week ended March 27, 1948, 24 cases of plague with 8 deaths were reported in Lucknow, India.

Portugal—Azores.—For the period February 1–14, 1948, 3 cases of plague with 2 deaths were reported in the Ponta Delgada area, Azores, Portugal (4 cases with 1 death were reported in January 1948).

Smallpox

China—Shanghai.—For the week ended April 3, 1948, 94 cases of smallpox were reported in Shanghai, China.

France—Seine Department.—During the period February 16–March 31, 1948, 3 cases of smallpox were reported in Seine Department, France.

India—Calcutta.—For the week ended April 3, 1948, 212 cases of smallpox were reported in Calcutta, India.

Portugal—Lisbon.—For the period March 1–27, 1948, 25 cases of smallpox with 2 deaths were reported in Lisbon, Portugal.

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains ([illegible] current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1948

For sale by the Superintendent of Documents, Washington 25, D. C.

Price 10 cents. Subscription price $4.00 a year.

U. S. GOVERNMENT PRINTING OFFICE: 1948

Public Health Reports

VOLUME 63 MAY 14, 1948 NUMBER 20

IN THIS ISSUE

Infant Illness and Mortality Rates

1798

FEDERAL SECURITY AGENCY

PUBLIC HEALTH SERVICE

FEDERAL SECURITY AGENCY

OSCAR R. EWING, *Administrator*

PUBLIC HEALTH SERVICE

LEONARD A. SCHEELE, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

CONTENTS

Page

Illness among infants, with comparative mortality data. Selwyn D. Collins ---------- 637

Deaths during week ended April 17, 1948 ---------- 662

INCIDENCE OF DISEASE

United States:

Reports from States for week ended April 24, 1948, and comparison with former years ---------- 663

Weekly reports from cities:

City reports for week ended April 17, 1948 ---------- 667

Rates, by geographic divisions, for a group of selected cities ---------- 669

Territories and possessions:

Puerto Rico—Notifiable diseases—5 weeks ended April 3, 1948 -- 669

Foreign reports:

Canada—Provinces—Communicable diseases—Week ended April 3, 1948 ---------- 670

Jamaica—Notifiable diseases—5 weeks ended April 3, 1948 ---------- 670

Japan—Notifiable diseases—5 weeks ended April 3, 1948, and total reported for the year to date ---------- 671

New Zealand—Notifiable diseases—5 weeks ended April 3, 1948 ---------- 671

Tunisia—Notifiable diseases—Year 1947 ---------- 671

Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—

Cholera ---------- 672

Plague ---------- 672

Smallpox ---------- 672

Typhus fever ---------- 672

Public Health Reports

Vol. 63 • MAY 14, 1948 • *No. 20*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

ILLNESS AMONG INFANTS, WITH COMPARATIVE MORTALITY DATA[1]

By SELWYN D. COLLINS, *Head Statistician, Public Health Service*

There has been little attempt to measure the extent of illness among infants under 1 year of age. With the considerable number of premature infants and of artificially fed infants for whom it is difficult to secure a satisfactory formula, the absence of records of illness may reflect the difficulty of determining when the baby is sick. With the increasing consultations for well and near-well babies at clinics and in physicians' offices, a visit to a doctor is no longer an indication of illness of the infant.

In spite of these difficulties, there have been attempts to record illnesses of infants by family canvasses. In connection with surveys of illness among unselected families in the general population over the past two decades, the Public Health Service has assembled a considerable mass of information on the frequency of illness among infants. As among children and adults, the illnesses recorded in periodic family canvasses are no doubt an incomplete statement of the total sickness which actually occurs; particularly is this true of colds and minor respiratory diseases. However, it is of interest to consider the extent of illness and the diagnoses most frequently reported among infants.

In contrast to the extremely meager data on illness among infants, most civilized countries have tabulated and published detailed data on the mortality of infants. Since the number of births during a year gives a good population base for the computation of infant mortality rates, there is not the difficulty experienced in general mortality of securing adequate annual population estimates. Thus, infant mortality has been computed and published by calendar months, by sex, by age of the infant, and for specific causes, over long periods of years. In the United States the birth registration area was established in 1915, but it was 1933 before all of the States were admitted to it. However, nearly all of the States were in the area by 1927 so that the trend of infant mortality over approximately two decades is now available for the country as a whole and for most of the States.

---

[1] From the Division of Public Health Methods, Public Health Service.

TABLE 1.—*Incidence of illness from broad causes among white male and female infants under 1 year of age in each of five family surveys*

[Sole or primary causes only]

	Annual case rate per 1,000 infants					Number of cases					Infant population	
	All diseases and injuries	Respiratory diseases	Digestive diseases	Communicable diseases	All other diseases and injuries	All diseases and injuries	Respiratory diseases	Digestive diseases	Communicable diseases	All other diseases and injuries	Years of life	Number of infants
Both sexes:												
130 communities:[1]												
12-month families	1,342	561	234	175	372	1,326	554	231	173	368	988.2	1,693
3- to 11-month families	1,291	541	218	105	428	160	67	27	13	53	123.9	310
Syracuse, N. Y.[2]	1,345	727	194	170	255	111	60	16	14	21	82.5	195
Cattaraugus County, N. Y.[2]	1,914	930	561	176	248	348	169	102	32	45	181.8	414
Hagerstown, Md.[3]	1,580	869	177	320	214	562	309	63	114	76	355.7	534
Males:												
130 communities:[1]												
12-month families	1,482	614	229	184	455	726	301	112	90	223	489.9	852
3- to 11-month families	1,464	666	266	50	483	88	40	16	3	29	60.1	149
Syracuse, N. Y.[2]	1,429	687	192	220	330	52	25	7	8	12	36.4	89
Cattaraugus County, N. Y.[2]	1,753	904	529	99	221	159	82	48	9	20	90.7	216
Hagerstown, Md.[3]	1,665	949	179	293	244	307	175	33	54	45	184.4	277
Females:												
130 communities:[1]												
12-month families	1,204	508	239	167	291	600	253	119	83	145	498.3	841
3- to 11-month families	1,129	423	172	157	376	72	27	11	10	24	63.8	161
Syracuse, N. Y.[2]	1,280	759	195	130	195	59	35	9	6	9	46.1	106
Cattaraugus County, N. Y.[2]	2,075	955	593	252	274	189	87	54	23	25	91.1	198
Hagerstown, Md.[3]	1,489	782	175	350	181	255	134	30	60	31	171.3	257

For notes and further details, see table 2.

SOURCE AND CHARACTER OF DATA

The data for this study are taken from five different illness studies conducted by periodic canvasses of families within the past 25 years. Footnotes to table 2 give references that discuss the general setting of each study but they do not contain data on illness among infants. In each survey the families were visited at intervals of 2 to 4 months and a record made of any illness of any member of the family which had occurred since the preceding visit. The record included sickness of infants which was tabulated by month of age and related to a careful count of the infants under observation at each month of age up to 12 months. The record of illness of infants as presented in this study is carried only through the first year of life and thus corresponds to the concept of infant mortality which pertains only to the first 12 months of life.

Table 1 shows illness rates for infants as recorded in each of the five studies, for all causes and for four broad disease groups. The illness rate from all causes among infants of all ages varies in the different studies from about 1,300 to 1,900 per 1,000 full-time years of infant observation. While there is large variability in each of the broad diagnosis groups as between the different studies, it should be

TABLE 2.—*Age incidence of illness from all causes among white infants in each of 5 family surveys*

[Sole or primary causes only]

	Total under 1 year	Age in completed months				
		Under 1	1–2	3–5	6–8	9–11
	Annual case rate per 1,000 infants					
130 communities:[1]						
12-month families (1928–31)	1,342	2,273	912	1,241	1,389	1,375
3- to 11-month families (1928–31)	1,291	1,488	1,068	1,143	1,706	1,047
Syracuse, 18 months (1930–31)[2]	1,345	2,137	1,393	1,037	1,088	1,656
Cattaraugus County, 33 months (1929–32)[2]	1,914	3,551	1,591	1,716	1,905	1,786
Hagerstown, 28 months (1921–24)[3]	1,580	1,417	810	1,518	1,844	1,946
	Number of cases					
130 communities:[1]						
12-month families (1928–31)	1,326	154	128	299	376	369
3- to 11-month families (1928–31)	160	16	21	38	57	28
Syracuse, 18 months (1930–31)[2]	111	15	18	22	24	32
Cattaraugus County, 33 months (1929–32)[2]	348	55	49	79	83	82
Hagerstown, 28 months (1921–24)[3]	562	42	48	135	164	173
	Population (full-time years of life)					
130 communities:[1]						
12-month families (1928–31)	988.2	67.75	140.41	241.00	270.66	268.41
3- to 11-month families (1928–31)	123.9	10.75	19.66	33.28	33.46	26.75
Syracuse, 18 months (1930–31)[2]	82.5	7.02	12.92	21.22	22.05	19.32
Cattaraugus County, 33 months (1929–32)[2]	181.8	15.49	30.79	46.05	43.56	45.91
Hagerstown, 28 months (1921–24)[3]	355.7	29.65	59.28	88.92	88.92	88.92

For description of surveys see following references:

[1] Collins (*7, 8*).

[2] Randall (*11*), Sydenstricker and Collins (*4, 13*).

[3] Sydenstricker (*12*).

remembered that some of these studies represent relatively few infants; the order of magnitude of the rates seems sufficiently similar in the different groups to justify a combination of all five studies in an attempt to secure observations on a sufficient number of infants to give reasonably reliable rates.

Table 2 shows rates of illness from all causes among infants of various ages in the first year of life. In spite of small numbers the general pattern is rather consistently maintained of a high illness rate in early infancy, with lower rates thereafter.

TREND OF INFANT MORTALITY

No data are available on the trend of illness among infants. According to the surveys reported here, infants under 1 year had an illness rate of 1,447 cases per 1,000 years of life. Of this total, 669 cases per 1,000 were respiratory diseases, largely minor but including pneumonia which is not negligible among infants. Congenital malformations and the diseases peculiar to early infancy were recorded to the extent of only 56 cases per 1,000, leaving 722 cases per 1,000 due to miscellaneous causes.

In the absence of any data on the trend of infant sickness, the trend of infant mortality over the past 30 years may be considered. The use of these mortality data are not intended to suggest that sickness rates have shown the same trend but they do throw light on developments during the past three decades.

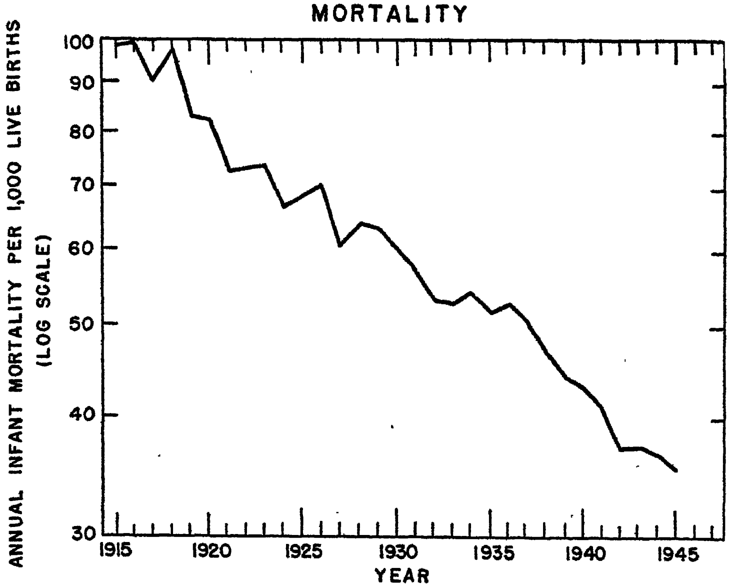


FIGURE 1.—Trend of mortality among white infants under 1 year of age in the United States birth registration area, 1915–45. (Data from references 10, p. 574 and 16, vol. 24 No. 1, and vol. 26 No. 1.)

The birth registration area in the United States was organized in 1915. Figure 1 shows the trend of infant mortality from all causes among white infants from 1915 to 1945, the last available year. In the few States in the area in 1915 the deaths under 1 year of age per 1,000 live births amounted to just under 100. The trend of the rate has been consistently downward until in 1943 it was only 37.5 and in 1945 it was 35.6. Of the rate of 35.6 per 1,000 in 1945, 23.2 per 1,000 were deaths due to congenital malformations and diseases peculiar to early infancy, including prematurity and other conditions largely due to prenatal influences. Mortality due to congenital malformations and diseases of early infancy has not decreased so much in the past generation, but deaths due to other causes have decreased rapidly to a rate of only 12.4 per 1,000 live births in 1945.

Figure 2 shows similar trends since 1927 for each sex, for different geographic sections of the United States, and for infants of different ages.

Considering geographic region, the rates for white infants have declined rather rapidly in all five sections shown on the chart. However, the Mountain States have shown a consistently high infant mortality and the Southern States have shown a mortality definitely higher than in the Northeast, North Central, and Pacific sections. Throughout the years covered, and particularly since 1937, these latter three sections have shown rates that were about the same.

Considering infant mortality by sex for the country as a whole, the trends for male and female infants have been approximately parallel, but the mortality of male infants has been consistently higher than that of female infants. In this and other charts shown here, 1927 is slightly below 1928 and 1929. Reference to figure 1 will indicate that this has no significance, except possibly that 1928 and 1929 reflect some excess mortality from influenza and pneumonia during those years which included an epidemic.

There are important differences in the trends of mortality among infants of different ages of the first year of life. For many years prior to the period covered in figure 2, the mortality of early infancy had remained approximately the same (*9*). Mortality at these early ages was due predominantly to congenital malformation, injury at birth, prematurity, and some ill-defined conditions. Particularly stationary was the mortality of the first day of life, but taken as a whole the rate for the first month of life also showed little decline. In figure 2 more detailed age groups are shown; mortality under the first day of life showed no decline prior to 1937 but from that year to 1945, the last available data, there was a consistent decline even for this age group. For the other 6 days of the first week of life the decline began earlier, about 1930, and continued rather consistently downward through 1945. Mortality during the remainder of the first month of life and up to 6 months of age showed considerably more rapid declines from 1936 to 1945 than was true of either of the age periods of the first week of life. In the two quarters of the last half of the first year of life the trends have been rather consistently downward throughout the period shown in figure 2.

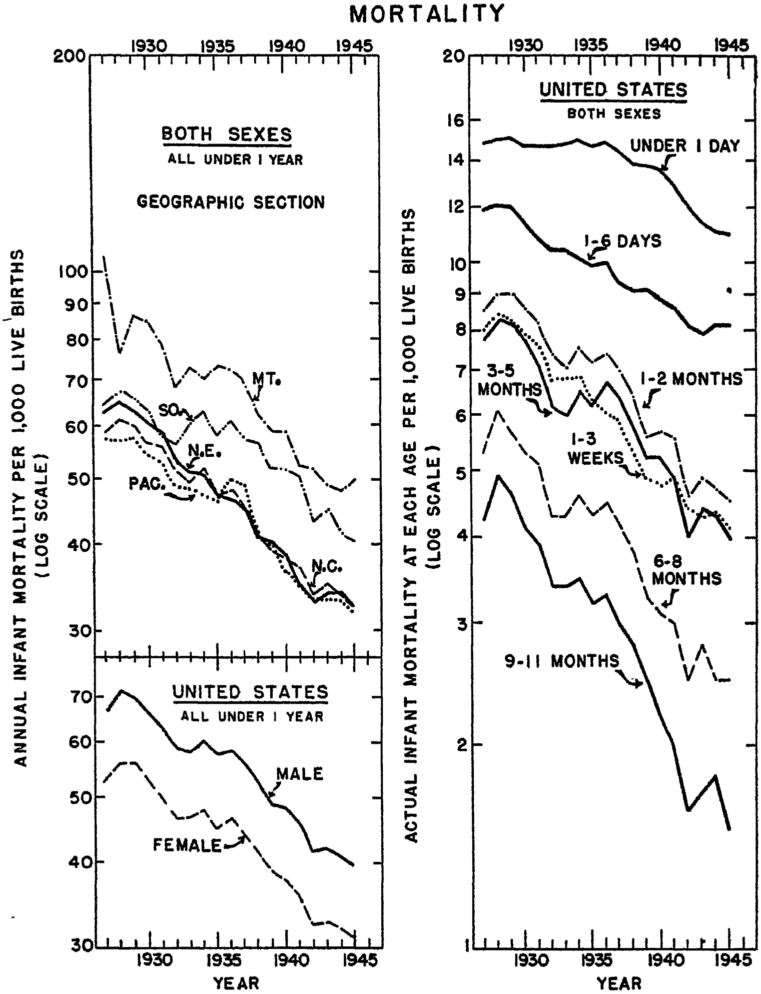


FIGURE 2.—Trend of mortality among white infants: (*a*) in five geographic sections; (*b*) among male and female infants; and (*c*) among infants of different ages—United States birth registration area, 1927–45. (Data by geographic section computed from reference 15; data by age from references 10, p. 574 and 16, vol. 17 No. 17, vol. 19 No. 11, vol. 21 No. 12, vol. 25 No. 12, vol. 27 No. 12; data by sex from references 14 and supplementary data, and 16, vol. 24 No. 1, and vol. 26 No. 1. The geographic sections in terms of standard U. S. Census sections are: N.E. (Northeast) = New England and Middle Atlantic; N. C. (North Central) = East and West North Central; SO. (South) = South Atlantic and East and West South Central; MT. = Mountain; PAC. = Pacific. In the Mountain region and in Texas the data are corrected to include Mexicans with white for the years 1930–36, as they are included in other years; in other sections and in the United States as a whole, no correction is needed because Mexicans are a very small percentage of the population.)

TABLE [illegible].—*Age incidence of illness from all causes and from respiratory and nonrespiratory diseases among white infants in five family surveys* [1]

[Sole or primary causes only]

Disease group	Total under 1 year	Age in completed months											
		Under 1	1	2	3	4	5	6	7	8	9	10	11
	Annual case rate per 1,000 infants												
All causes	1,447	2,158	874	1,130	1,387	1,304	1,304	1,593	1,490	1,533	1,499	1,551	1,517
Respiratory diseases	669	337	307	490	715	659	730	887	802	690	804	799	695
Nonrespiratory diseases	778	1,822	568	641	672	645	574	707	677	843	695	753	822
	Number of cases												
All causes	2,507	282	114	150	194	186	193	239	225	240	233	235	216
Respiratory diseases	1,159	44	40	65	100	94	108	133	122	108	125	121	99
Nonrespiratory diseases	1,348	238	74	85	94	92	85	106	103	132	108	114	117
	Infant population observed												
Full-time years of life	1,732.1	130.7	130.4	132.7	139.8	142.6	148.0	150.0	152.0	156.6	155.4	151.5	142.4
Number of individual infants	3,146	1,567	1,564	1,592	1,677	1,712	1,775	1,800	1,825	1,879	1,866	1,818	1,709

[1] For details about surveys see table 2.

AGE VARIATION, ALL CAUSES

Although infancy represents only a 12-month period, it is a time of great change in the resistance of the infant to sickness and mortality. It seems worth while, therefore, to consider illness and death rates at different periods of the first year of life.

Figure 3 shows illness rates for each month of the first year of life (table 3). The left half shows all causes. These rates are on an annual basis, which means that each rate represents the cases that would occur in the course of a year if the average daily number for the given age-period continued throughout the year. While this adjustment is not important when the rates are computed for monthly or other intervals of approximately the same length, it is very important when the length of the interval varies.

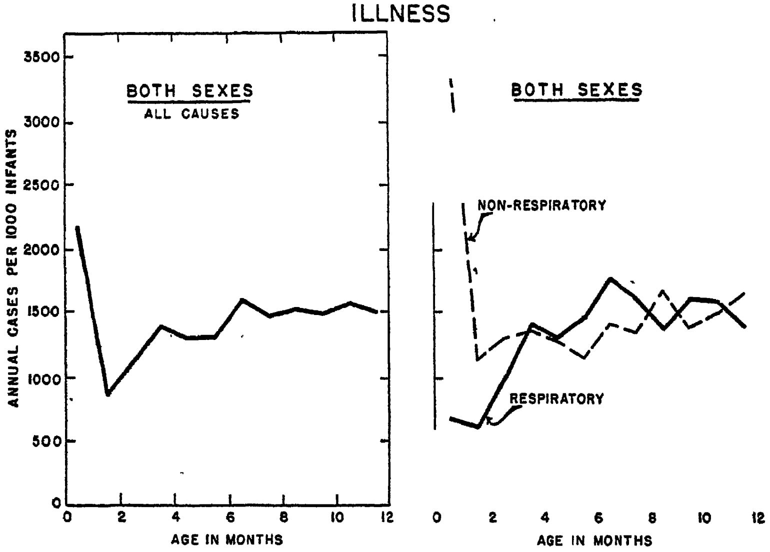


FIGURE 3.—Incidence of illness from all causes and from the two main causes among white infants of each month of age—five family surveys made by the Public Health Service.

Illness from all causes starts with a rather high rate for the first month of life and drops to the lowest rate in the second month, followed by a gradual increase to a level (annual basis) of about 1,500 cases per 1,000 throughout the last half of the first year of life. The right half of the figure divides illnesses into the two major groups of respiratory and nonrespiratory whose average rates for the year as a whole are roughly the same. As might have been expected, the non-respiratory diseases account for all of the high rate under 1 month of age. Later charts with more specific causes will indicate that this high peak is due to congenital malformations and the diseases peculiar to early infancy.

Figure 4 shows somewhat similar data for mortality (table 4). The data on illness were too few to break down further than the first month of life. However, the data on mortality are plotted in figure 4 for the ages under 1 week, 7 to 29 days, and by single months to the end of the first year of life. The mortality under 1 week of age greatly exceeds the point plotted on the chart and the rate has been printed on the chart. These rates are on an annual basis so that a rate of 993 for under 1 week of age would mean that if infants continued to die throughout the first year of life at the same average number per day as during the first seven days of life, practically all of them would be dead by the end of the first year of life. If the annual rate exceeded 1,000 per 1,000, it would mean that all of the infants would die before the end of the first year of life if they continued to die at the same average number per day as during the first week of life. Annual rates have been computed in this study because they better represent the true rate of mortality in one age-period as compared with another age-period of the first year of life.

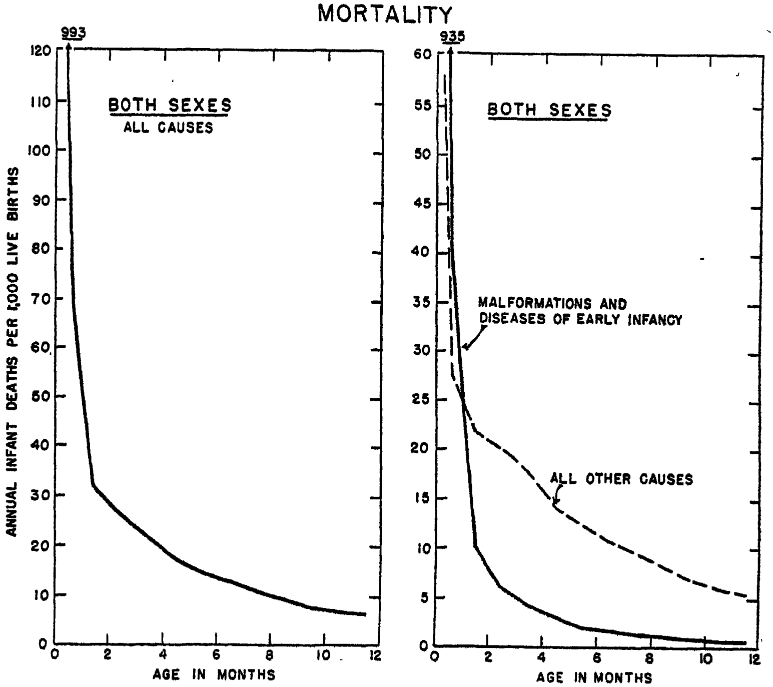


FIGURE 4.—Mortality from all causes and from the two main causes among white infants of each month of age—United States, 1943.

Considering both sexes, the death rate varied from 993 per 1,000 for the first week of life to 6 per 1,000 for the eleventh or last month of infancy. When rates are plotted for the two main causes of infant

TABLE 4.—*Annual*[1] *infant mortality from two broad causes among white male and female infants of specific ages in the continental United States, 1943*

Age in days and completed months	All causes			Malformations and early infancy (157-161)			All other causes		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
	Annual[1] infant mortality per 1,000 live births								
Total under 1 year	37.5	42.0	32.7	23.5	26.5	20.4	13.9	15.5	12.3
Under 1 day	4,097.0	4,653.6	3,507.6	3,970.0	4,509.0	3,399.3	126.9	144.6	108.3
1-2 days	916.5	1,065.8	758.5	852.2	986.6	709.8	64.4	79.2	48.7
3-6 days	255.8	295.8	213.3	218.4	252.6	182.3	37.3	43.2	31.1
Under 7 days	992.8	1,137.7	839.3	934.9	1,069.8	792.2	57.8	67.9	47.1
7-29 days	68.5	75.5	61.1	40.8	44.2	37.3	27.7	31.3	23.8
Under 1 month	284.1	323.3	242.6	249.5	283.5	213.4	34.7	39.8	29.2
1 month	32.0	36.6	27.1	10.2	11.4	8.9	21.8	25.2	18.2
2 months	26.2	29.1	23.1	6.1	6.6	5.6	20.1	22.6	17.5
3 months	21.7	23.5	19.8	4.3	4.5	4.1	17.4	19.0	15.7
4 months	17.2	18.6	15.6	3.1	3.0	3.1	14.1	15.6	12.5
5 months	14.6	16.1	13.0	2.2	2.4	2.0	12.4	13.7	11.0
6 months	12.7	13.5	11.9	1.9	1.8	2.0	10.8	11.7	9.9
7 months	10.9	11.9	9.7	1.5	1.6	1.5	9.3	10.4	8.2
8 months	9.5	10.1	8.9	1.2	1.2	1.2	8.3	8.9	7.6
9 months	7.8	7.9	7.6	1.0	1.0	1.0	6.8	6.9	6.6
10 months	6.8	7.1	6.5	.7	.8	.7	6.1	6.3	5.8
11 months	6.3	6.3	6.2	.7	.7	.8	5.5	5.6	5.4

[1] Annual rates as here used mean the number of deaths per 1,000 live births that would have occurred in 360 days if the deaths per day for the given age period had continued for a year of 12 30-day months. The number of live births for the whole year was: both sexes 2,594,763; male 1,334,563; female 1,260,200.

mortality, malformations and diseases of early infancy are seen to be the major factor in the high peak for under 1 week of age but there is a rather high peak also for other diseases.

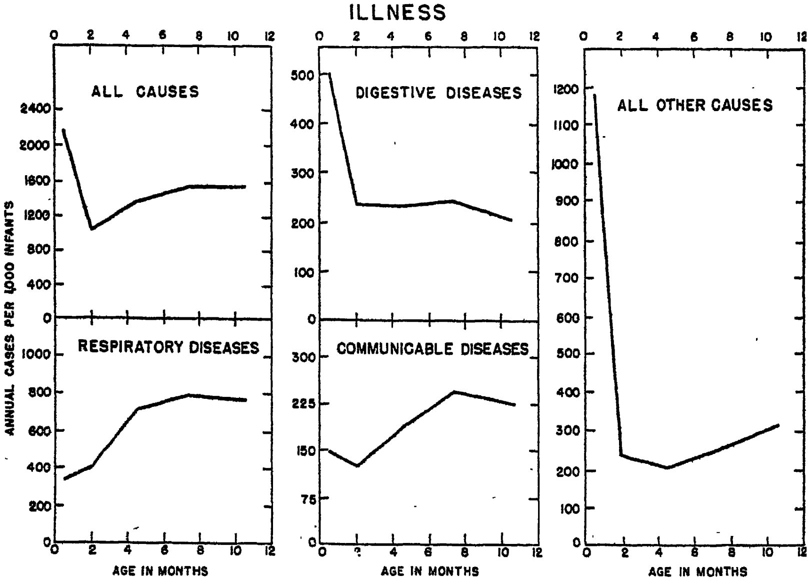


FIGURE 5.—Incidence of illness from broad disease groups among white infants of specific ages—five family surveys. (Ages in months: under 1, 1-2, 3-5, 6-8, 9-11. Scales so arranged that rate for both sexes of all ages under 1 year plots on the vertical rate scale at a distance equal to 6.7 months on the horizontal age scale, thus making the curves comparable on a relative basis.)

BROAD CAUSES OF ILLNESS AND MORTALITY

Figure 5 shows illness rates during the first year of life for four broad causes for the ages under 1 month, 1–2 months, and for the next 3 quarters of the first year of life (table 5). Figure 6 shows similar curves for five important causes of mortality during the first year of life (table 6). Because of the larger amount of data on mortality for the total United States, rates under 1 month of age have been divided into two parts, under 7 days and 7–29 days, with rates above 1 month in the same age groups as in the morbidity chart. With the exception of digestive diseases, which has a low rate for the period under 1 week of age, the death rates from all four causes decline rapidly as age increases. On the other hand, illness from at least two causes increases with age, the lowest rates occurring in the early age groups for both respiratory and communicable diseases. However, digestive and the miscellaneous other diseases show high illness rates in the first month of life.

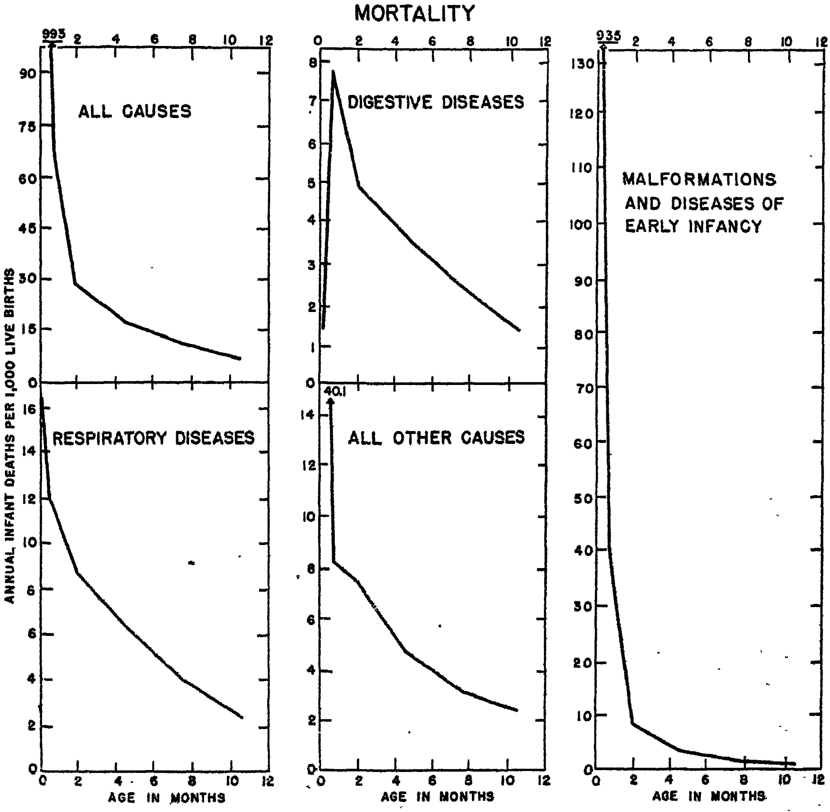


FIGURE 6.—Mortality from broad disease groups among white infants of specific ages—United States 1943. (Ages: under 7 days; 7-29 days; and in months, 1-2, 3-5, 6-8, 9-11. See fig. 5 for other details.)

TABLE 5.—*Age incidence of illness from broad causes among white infants of each sex in 5 family surveys* [1]

[Sole or primary causes only]

	Total under 1 year	Age in completed months					Total under 1 year	Age in completed months				
		Under 1	1–2	3–5	6–8	9–11		Under 1	1–2	3–5	6–8	9–11
	Annual case rate per 1,000 infants						Number of cases					
All causes:												
Both sexes	1,447	2,158	1,004	1,331	1,535	1,522	2,507	282	264	573	704	684
Male	1,546	2,572	996	1,488	1,568	1,599	1,332	169	130	317	356	360
Female	1,350	1,740	1,011	1,178	1,503	1,446	1,175	113	134	256	348	324
Respiratory diseases:												
Both sexes	669	337	399	702	792	708	1,159	44	105	302	363	345
Male	723	411	414	817	863	764	623	27	54	174	196	172
Female	616	262	385	589	721	772	536	17	51	128	167	173
Digestive diseases: [2]												
Both sexes	253	505	239	237	246	211	439	66	63	102	113	95
Male	251	533	261	225	229	209	216	35	34	48	52	47
Female	256	477	219	248	263	214	223	31	29	54	61	48
Communicable diseases:												
Both sexes	200	145	125	186	244	227	346	19	33	80	112	102
Male	190	167	77	211	198	235	164	11	10	45	45	53
Female	209	123	174	161	289	219	182	8	23	35	67	49
All other diseases and injuries: [2]												
Both sexes	325	1,171	239	207	253	316	563	153	63	89	116	142
Male	382	1,461	245	235	278	391	329	96	32	50	63	88
Female	269	877	234	179	229	241	234	57	31	39	53	54
	Fulltime years of life						Number of individual infants					
Male	861.5	65.7	130.5	213.1	227.0	225.2	1,583	788	792	887	937	935
Female	870.6	65.0	132.6	217.3	231.6	224.1	1,563	779	809	893	957	940

---

[1] For details about surveys see table 2.

[2] Teething and gum inflammation is included in "all other" and not in "digestive."

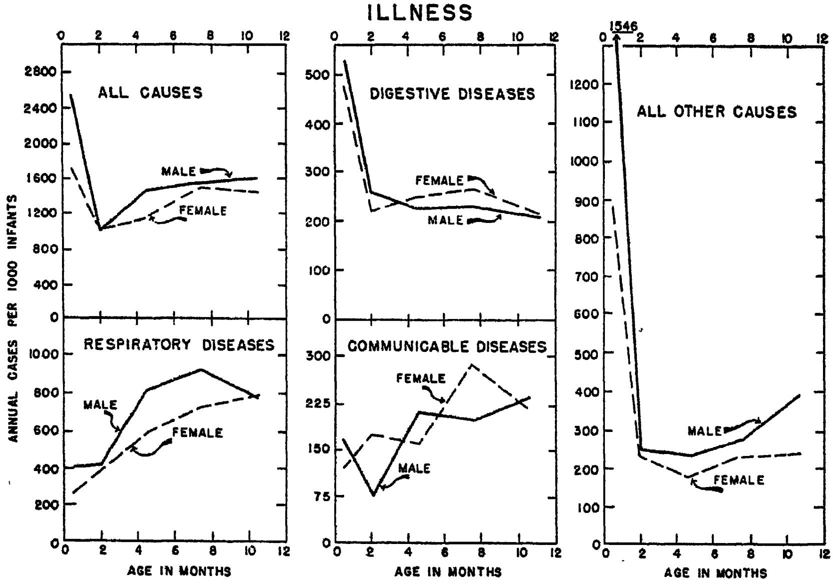


FIGURE 7.—Incidence of illness from broad disease groups among white male and female infants of specific ages—five family surveys. (Ages in months: under 1, 1–2, 3–5, 6–8, 9–11. See fig. 5 for other details.)

Figures 7 and 8 show similar data for male and female infants. Considering first mortality from all causes, it has been repeatedly noted that the death rate for males even in the first year of life is consistently above that of females. Reference to table 4 will indicate that this is consistently true when the mortality under 1 month is broken into finer age groups and is also true for each of the 12 months of life taken separately. The relative age incidence of illness from all causes is different from that of mortality, but the illness rates for males are rather consistently above those for females, the only exception being that the rate is slightly higher for females in the age period 1–2 months.

Considering the four broad causes of death shown in figure 8 the mortality of males is consistently higher than that of females, with the exception of congenital malformations and diseases of early infancy in the last half of the first year of life when the rates are

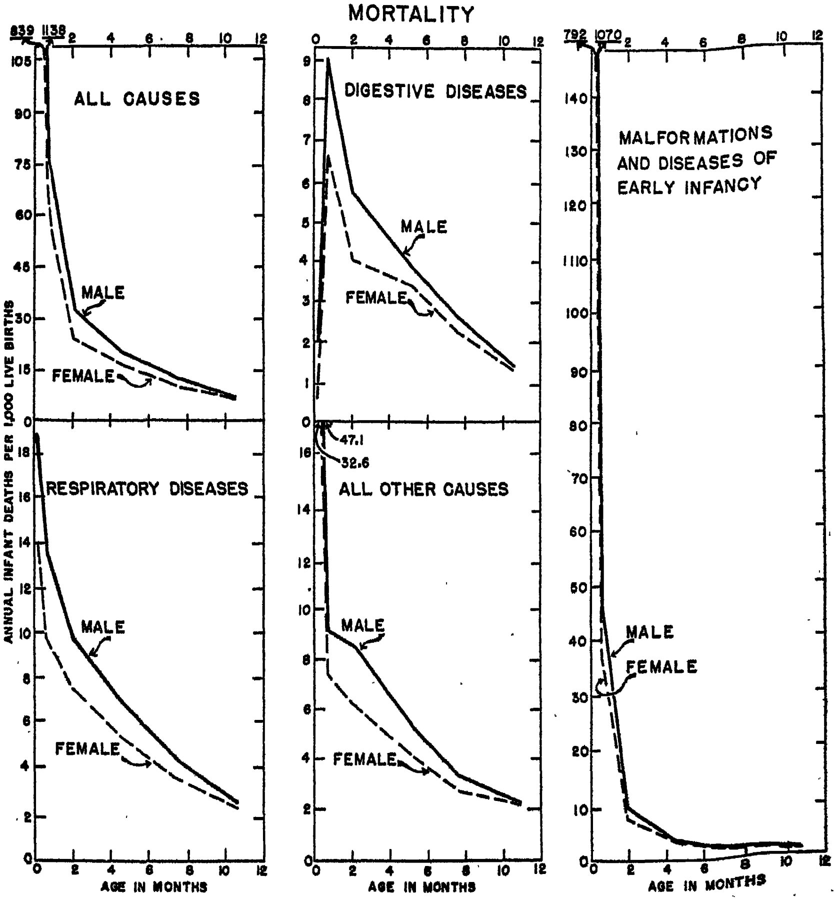


FIGURE 8.—Mortality from broad disease groups among white male and female infants of specific ages—United States, 1943. (Ages: under 7 days; 7-29 days; and in months, 1-2, 3-5, 6-8, 9-11. See fig. 5 for other details.)

approximately the same. Considering the four broad causes of illness shown in figure 7, there is more variation with respect to sex differences in the rates. For digestive diseases the rates for males exceed those for females only in the first quarter of the first year of life, with higher rates for females in the other three quarters. The rather irregular curves for the communicable diseases indicate no particular sex differences for this group as a whole. However, for respiratory diseases and for all other causes the illness rates for males are rather consistently above those for females.

TABLE 6.—*Annual [1] infant mortality from broad causes among white infants of specific ages in the continental United States, 1943*

Cause of death and sex of decedent (international list numbers, 1938 revision).	Total under 1 year		Age						
			In days		In completed months				
			Under 7	7–29	Under 1	1–2	3–5	6–8	9–11
	Number of deaths	Annual [1] infant mortality per 1,000 live births							
All causes:									
Both sexes	97,229	37.47	992.77	68.50	284.13	29.09	17.81	11.04	6.94
Male	56,060	42.01	1,137.73	75.51	323.33	32.86	19.38	11.86	7.10
Female	41,169	32.67	839.26	61.07	242.62	25.10	16.15	10.16	6.76
Respiratory diseases (33, 104–114):									
Both sexes	14,745	5.68	16.34	11.69	12.75	8.70	6.29	3.97	2.41
Male	8,430	6.32	18.72	13.35	14.58	9.73	7.01	4.40	2.51
Female	6,315	5.01	13.83	9.93	10.82	7.61	5.53	3.53	2.31
Digestive diseases (27, 119, 122b):									
Both sexes	8,300	3.20	1.41	7.83	6.31	4.91	3.66	2.41	1.35
Male	4,702	3.52	2.08	8.98	7.35	5.71	3.89	2.58	1.36
Female	3,598	2.86	.69	6.62	5.22	4.06	3.40	2.24	1.34
Malformations and early infancy (157–161):									
Both sexes	61,074	23.54	934.95	40.82	249.48	8.15	3.18	1.55	.82
Male	35,408	26.53	1,069.79	44.19	283.53	8.97	3.28	1.53	.82
Female	25,666	20.37	792.15	37.26	213.42	7.28	3.08	1.57	.82
All other causes:									
Both sexes	13,110	5.05	40.07	8.16	15.59	7.33	4.68	3.10	2.35
Male	7,520	5.63	47.14	9.00	17.88	8.44	5.19	3.35	2.41
Female	5,590	4.44	32.59	7.26	13.16	6.15	4.14	2.82	2.29

[1] See footnote to table 4.

SPECIFIC CAUSES OF ILLNESS AND MORTALITY

Specific causes of illness and death give more exact information than broad groups of causes such as those shown in earlier pages of this report. Figure 9 has been drawn to contrast the 15 most frequent causes of illness with the 15 most frequent causes of mortality among infants. As seen here, coryza and colds represent by far the most frequent type of illness among infants, with bronchitis as the second cause. Influenza comes rather far down the list and pharyngitis and other throat conditions are rather infrequent, being the thirteenth cause. However, pneumonia is the tenth cause of illness among infants. Diarrhea and enteritis and other digestive disturbances considered separately are both near the top of the list.

With the exception of pneumonia which is the third cause of death and of diarrhea and enteritis which is the fifth, the first eight causes of mortality all relate to congenital malformations and the diseases peculiar to early infancy. Of these conditions, premature birth stands at the top and congenital malformations second. It is worth noting that whooping cough and influenza are the ninth and tenth causes of death.

TABLE 7.—*Age incidence of illness from specific causes among white infants in 5 family surveys* [1]

[Sole, primary, and contributory causes]

Disease	Total under 1 year		Age in completed months				
			Under 1	1–2	3–5	6–8	9–11
	Number of cases	Annual case rate per 1,000 infants					
Coryza and cold	604	348.7	214.3	220.5	362.4	407.8	389.5
Bronchitis	278	160.5	45.9	110.2	181.2	172.3	191.4
Influenza	130	75.1	23.0	26.6	72.0	104.7	91.3
Pharyngitis, tonsillitis, laryngitis, and sore throat	60	34.6	7.7	11.4	20.9	48.0	55.6
Pneumonia (all forms)	78	45.0	45.9	30.4	48.8	56.7	37.8
Other respiratory diseases	36	20.8	15.3	7.6	25.6	21.8	24.5
Diarrhea and enteritis	224	129.3	237.3	95.0	120.8	135.2	120.2
Other digestive diseases	244	140.9	298.5	178.7	130.1	126.5	97.9
Whooping cough	149	86.0	68.9	57.0	90.6	106.8	82.4
Measles	93	53.7	7.7	19.0	39.5	82.9	71.2
Chickenpox	52	30.0	23.0	26.6	18.6	37.1	37.8
Other communicable diseases	56	32.3	45.9	26.6	37.2	24.0	35.6
Eye diseases	38	21.9	114.8	22.8	16.3	6.5	15.6
Ear and mastoid diseases	113	65.2	7.7	53.2	51.1	78.5	89.0
Eczema	65	37.5	53.6	26.6	39.5	37.1	37.8
Other skin diseases	53	30.6	61.2	26.6	18.6	34.9	33.4
Teething and gum inflammation	72	41.6	-------	3.8	13.9	74.1	69.0
Malformations and diseases of early infancy	97	56.0	528.1	60.8	16.3	2.2	8.9
Genito-urinary diseases, except circumcision	24	13.9	38.3	11.4	13.9	13.1	8.9
Circumcisions [2]	65	96.0	854.4	60.1	35.9	33.2	22.3
All other diseases	97	56.0	107.1	26.6	51.1	58.9	60.1
All accidents and violence	43	24.2	7.7	19.0	11.6	19.6	51.2
	Infant population observed						
Full-time years of life	1,732.1		130.7	263.1	430.4	458.6	449.3
Number of individual infants	3,146		1,567	1,601	1,780	1,894	1,875

---

[1] See table 2 for communities covered and other details.

[2] Circumcision is expressed in annual rates per 1,000 male infants in the 4 surveys, excluding Hagerstown. The 43 circumcisions under 1 month of age amounted to 71.2 per 1,000 male live births (604) in the 4 surveys exclusive of Hagerstown where only 1 circumcision was recorded.

Many of the important causes of illness and death vary considerably in frequency during the different months of age. Figure 10 shows illness rates at specific ages of the first year of life for a considerable number of the detailed causes (table 7). The scales of this figure are so arranged that the rate for all ages represents a distance on the vertical scale that is equal to 6.7 months on the horizontal scale; thus the curves are comparable on a relative basis. In other words, those with the greatest variability in the rates as plotted are the causes that have the largest relative variability with age within the first year of life.

Figure 11 shows similar data arranged in the same way for the more important specific causes of death among infants (table 8). Again it must be remembered that the first point plotted in these death curves represents the ages under 1 week, whereas the first point in the illness curves represents the whole first month of life. Discounting the point for the first week of life, these mortality curves are at least roughly comparable in a relative way to the illness curves.

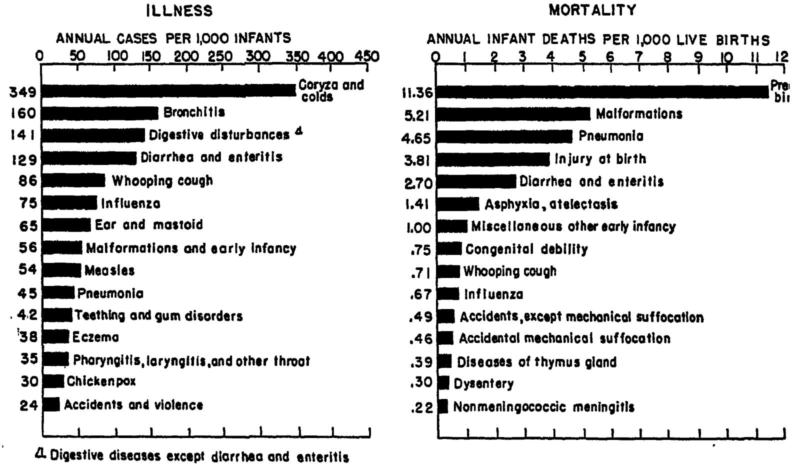


FIGURE 9.—The 15 most important causes of illness and the 15 most important causes of mortality among white infants under 1 year of age—illness in five family surveys and mortality in the United States, 1943. (Scales so arranged that bars for all causes would plot as approximately the same length for illness and mortality.)

Little space need be taken to discuss the age variation of illness and mortality for each of the important diseases of infancy. There is much variability in nearly all instances. In addition to high peaks at the youngest ages for illness from diseases and conditions of prenatal and natal origin, the digestive and genito-urinary disorders have high rates in the youngest ages, with the possible exception of the first week of life in which the death rate from diarrhea and enteritis is low. Illness rates from influenza, bronchitis, and coryza, on the other hand, all rise with age presumably because of the greater care in early infancy to keep the baby from contact with persons suffering from these disorders. Lower death rates in early infancy tend to be true of other infectious diseases such as measles, meningitis, ear and mastoid diseases, and tuberculosis—diseases in which infection occurs after birth. The opposite is true of syphilis which is usually congenital at these early ages.

More extensive data on the common communicable diseases of childhood obtained in another study (*1*, *2*, *3*, *5*, *6*) are shown in figure 12 (table 9). The incidence of every one of these diseases increases with age, which is presumably due not only to increasing contact with these diseases as the infant grows older, but also to the gradual loss of immunity the infant presumably obtained from its mother. The data in this additional study were tabulated in a way to count the number of infants who were exposed by household contact to a case of each of these diseases, and to indicate the age of the infant at the time of such contact with the disease. Thus it was possible to set up by month of age secondary attack rates for each disease to show the percentage of infants exposed to the disease who developed a clinical case.

TABLE 8.—*Annual* [1] *infant mortality from specific causes among white infants of specific ages in the continental United States, 1943*

Cause of death (international list number, 1938 revision)	Total under 1 year		Age						
			In days		In completed months				
			Under 7	7-29	Under 1	1-2	3-5	6-8	9-11
	Number of deaths	Annual [1] infant mortality per 1,000 live births							
All causes	97,229	37.47	992.77	68.50	284.13	29.09	17.81	11.04	6.94
Pneumonia (all forms) (107-109)	12,066	4.65	14.32	10.24	11.17	7.20	5.13	3.11	1.85
Influenza (33)	1,744	.67	.79	.91	.88	.91	.78	.61	.39
Other diseases of respiratory system (104-106, 110-114)	935	.36	1.23	.54	.70	.59	.38	.25	.18
Diarrhea and enteritis (119)	6,997	2.70	1.21	7.41	5.94	4.30	2.94	1.91	1.09
Intestinal obstruction (122b)	516	.20	------	.08	.06	.24	.31	.20	.11
Dysentery (27)	787	.30	.20	.34	.31	.37	.41	.30	.15
Whooping cough (9)	1,844	.71	.02	.47	.36	1.45	.79	.57	.39
Measles (35)	263	.10	.04	.07	.06	.06	.09	.10	.16
Tuberculosis (all forms) (13-22)	331	.13	------	.04	.03	.05	.12	.19	.16
Syphilis (30)	305	.12	1.76	.21	.57	.26	.07	.02	.02
Cerebrospinal meningitis (6)	282	.11	.06	.07	.06	.12	.16	.09	.09
Meningitis (not due to meningococcus) (81)	563	.22	.26	.21	.22	.31	.23	.21	.15
Convulsions (86)	276	.11	1.78	.22	.59	.10	.07	.07	.03
Diseases of ear and mastoid process (89)	250	.10	.08	.04	.05	.12	.13	.10	.06
Intracranial lesions of vascular origin (83)	173	.07	.67	.04	.18	.13	.06	.02	.03
Diseases of the heart (90-95)	144	.06	.28	.10	.14	.08	.07	.03	.02
Diseases of thymus gland (64)	1,012	.39	5.25	.86	1.88	.64	.32	.12	.06
Congenital malformations (157)	13,529	5.21	123.61	15.27	40.53	4.87	2.22	1.22	.65
Congenital debility (158)	1,949	.75	13.87	1.82	4.63	1.08	.49	.17	.09
Premature birth (159)	29,469	11.36	514.22	16.40	132.59	1.45	.22	.04	.01
Injury at birth (160)	9,874	3.81	180.88	3.24	44.70	.24	.08	.04	.04
Asphyxia, atelectasis (161a)	3,665	1.41	66.02	1.12	16.27	.19	.06	.02	.01
Other diseases of early infancy (161b, c)	2,588	1.00	36.35	2.97	10.76	.32	.11	.06	.03
Accidental mechanical suffocation (182)	1,189	.46	1.13	.76	.84	1.07	.63	.15	.06
Other accidental deaths	1,283	.49	2.04	.54	.89	.61	.45	.41	.41

[1] See footnote to table 4.

Whooping cough, which shows a high incidence, also shows a high secondary attack rate. With the exception of infants under 1 month of age, the secondary attack rates for whooping cough range from 50 to 100 percent. Similar rates for chickenpox show about the same curve with a maximum secondary attack rate of 75 to 80 percent. On the other hand, measles, with rather high incidence rates, has a much lower secondary attack rate and this is true also of German measles and mumps. For these three diseases the secondary attack

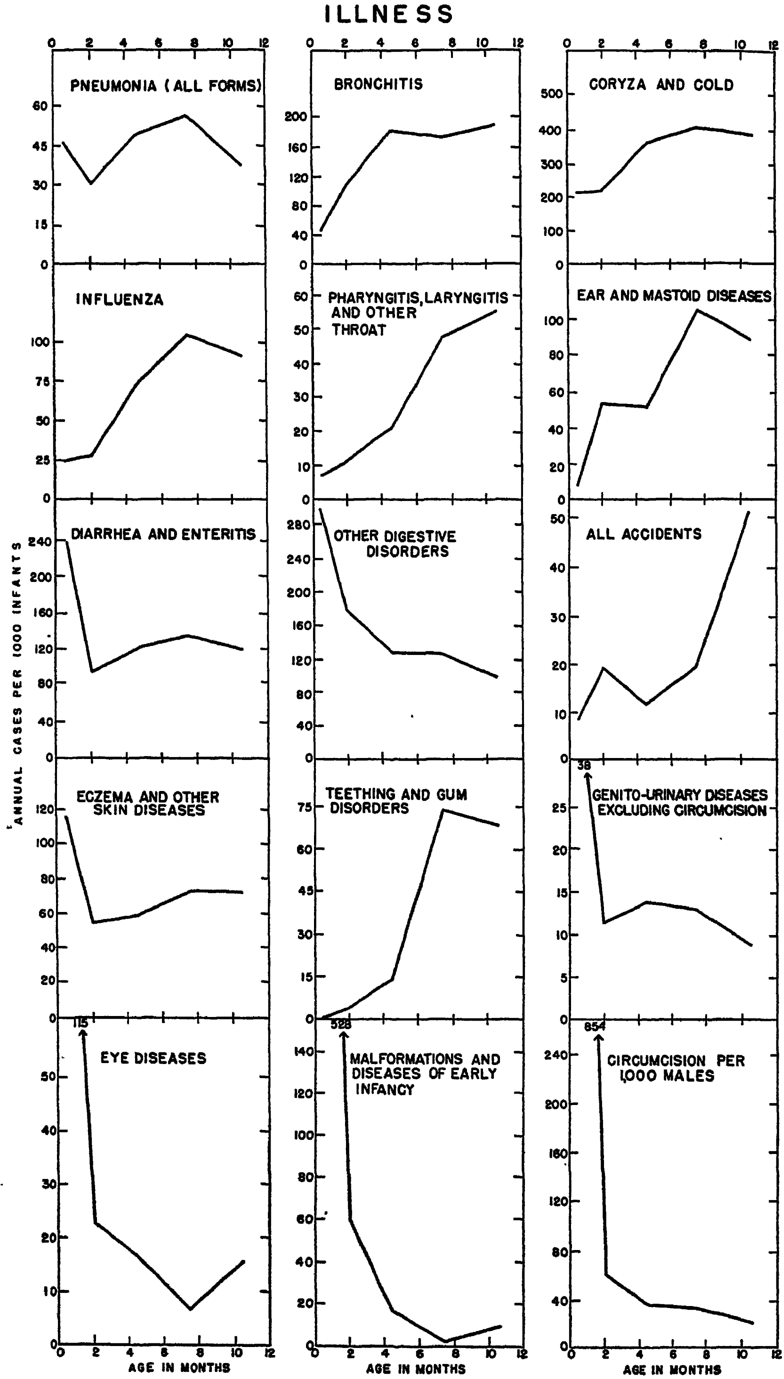


FIGURE 10.—Incidence of illness from specific causes among white infants of different ages—five family surveys. (Ages in months: under 1, 1-2, 3-5, 6-8, 9-11. See fig. 5 for other details.)

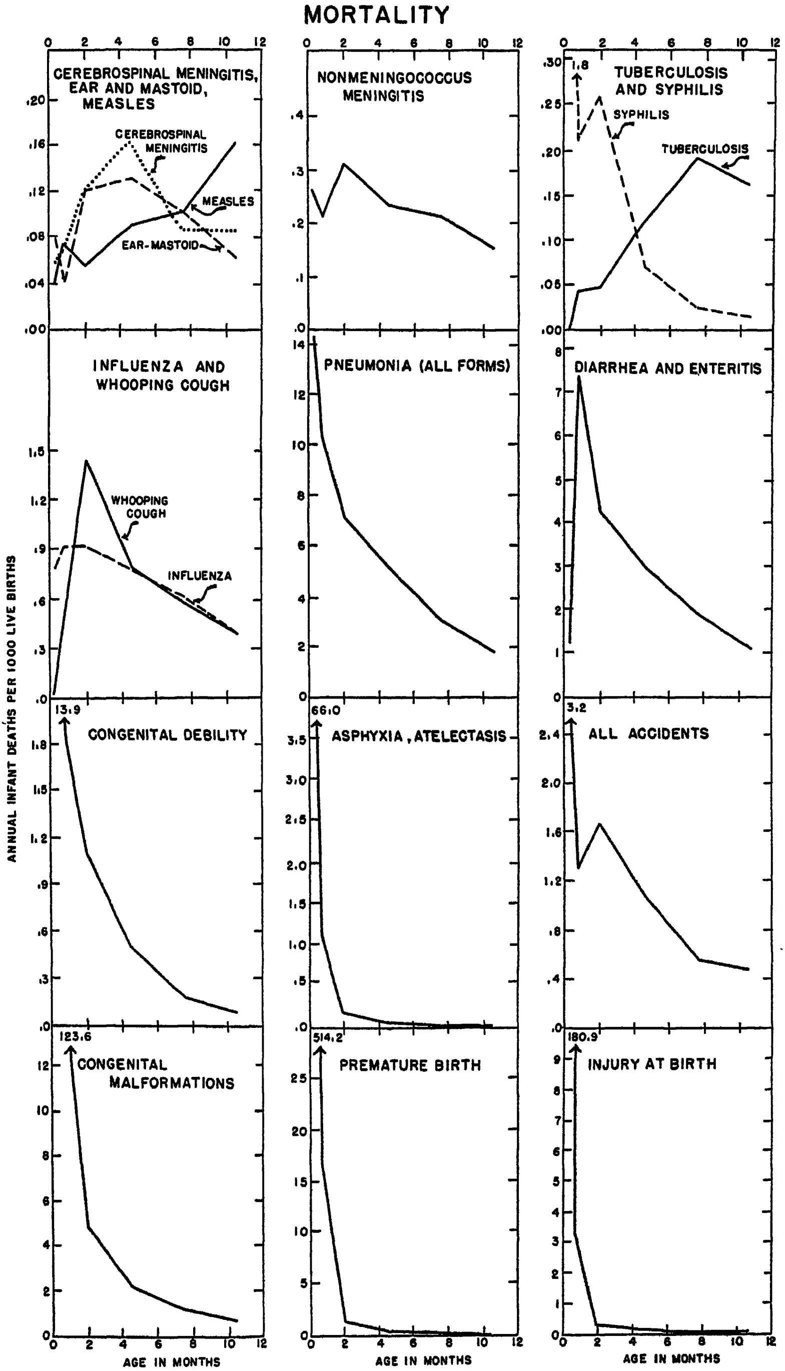


FIGURE 11.—Mortality from specific causes among white infants of different ages—United States, 1943. (Ages: under 7 days; 7–29 days; and in months, 1–2, 3–5, 6–8, 9–11. See fig. 5 for other details.)

rates under 6 months of age are less than 20 percent in every age group, but above 6 months both measles and German measles show secondary attack rates of roughly 40 percent. Mumps, however, does not get appreciably above the 20 percent level.

The preceding charts have shown the incidence and mortality from specific diseases in a way to compare the rate of a given disease at a specific age with the rates for the same disease at other ages. The data, however, may be set up in a way to pick out the important diseases for each age group rather than to follow the curve of the rates for a given disease throughout the period of infancy. Figure 13 shows such data for five age periods of the first year of life, including the seven most frequent causes of illness and the seven most frequent causes of mortality for each age group.

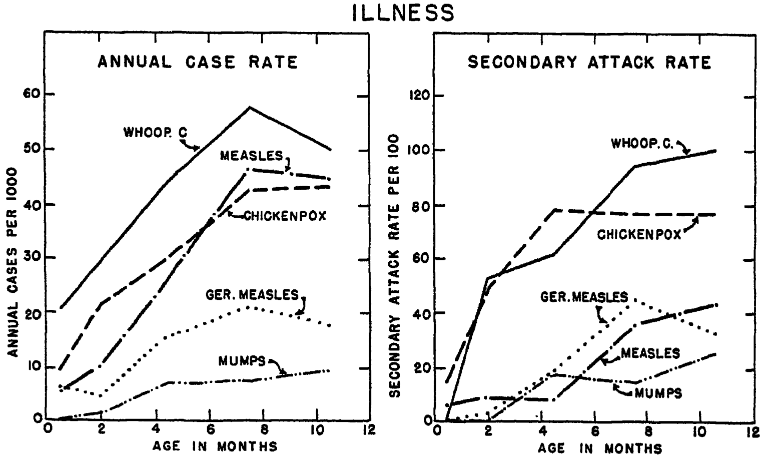
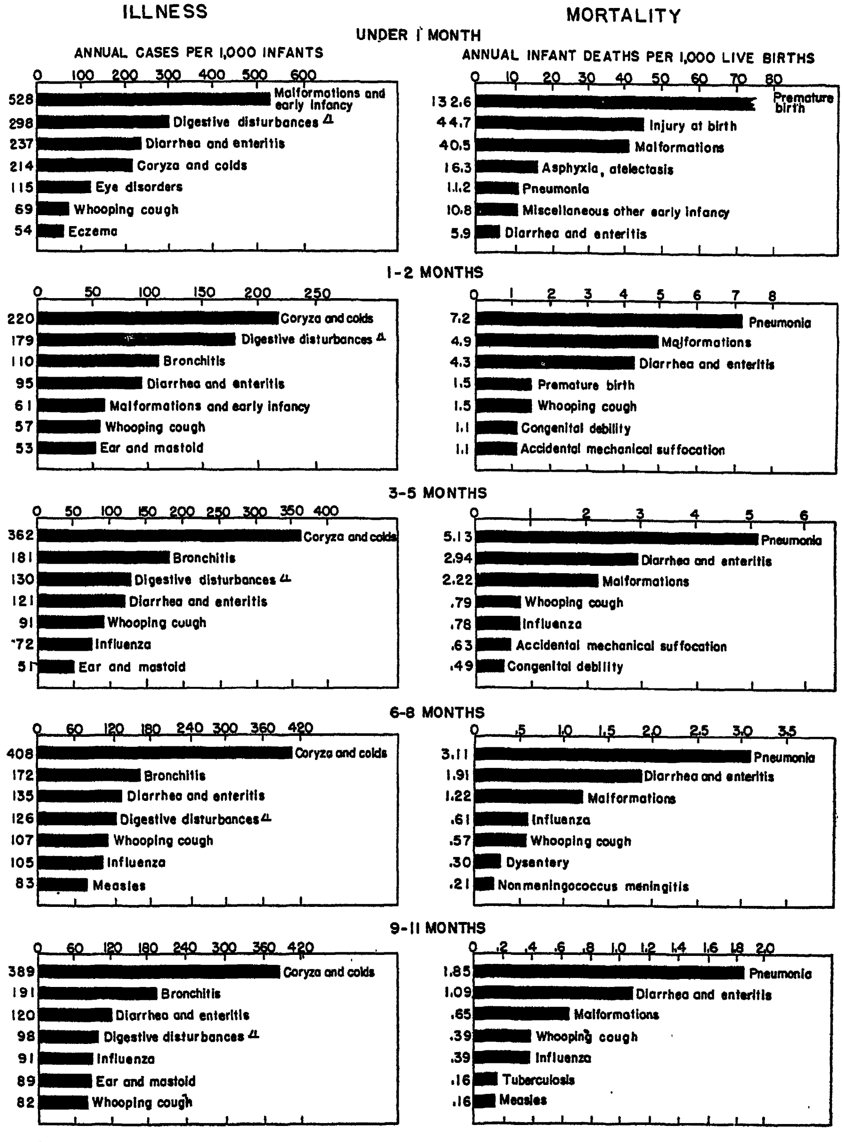


FIGURE 12.—Incidence of five common communicable diseases among white infants of specific ages within the first year of life: (*a*) annual case rates, and (*b*) secondary attack rates. (Ages in months: under 1, 1–2, 3–5, 6–8, 9–11. Secondary attack rates refer to attacks of the given disease per 100 infants exposed to a case in the household.)

Among infants under 1 month of age malformations and the diseases peculiar to early infancy are the major cause of illness but for every other age group coryza and colds are the most frequent disorder. Under 1 month of age the digestive disturbances and diarrhea and enteritis are next in frequency, and in the other age groups digestive disturbances and respiratory conditions such as bronchitis compete for second place.

For children under 1 month of age, five of the seven most frequent causes of mortality are diseases due to natal and prenatal influences, premature birth being the overwhelming cause of death. However, pneumonia is the fifth cause and diarrhea and enteritis the seventh cause of death. For each of the other four age groups, pneumonia is the major cause of death with diarrhea and enteritis and malformations competing for second place. Whooping cough is either the fourth or fifth cause of death in each of the four age groups above 1 month of age, and influenza is either the fourth or fifth cause in the three age groups above 3 months. Tuberculosis is inlcuded in the first seven causes only in the age group 9–11 months.



Δ Digestive diseases except diarrhea and enteritis

FIGURE 13.—The seven most important causes of illness and the seven most important causes of mortality among white infants of specific ages within the first year of life—illness in five family surveys and mortality in the United States, 1943. (Scales so arranged that bars for all causes would plot as approximately the same length for illness and mortality and for each of the 5 age groups.)

TABLE 9.—*Incidence and secondary attack rates of common communicable diseases among white infants of specific ages in 6 family surveys*

Disease	Total under 1 year (adjusted [1])		Age in completed months				
			Under 1	1–2	3–5	6–8	9–11
	Number of cases	Annual case rate [3] per 1,000 infants					
Whooping cough	265	44.7	20.4	29.1	44.4	57.8	50.3
Chickenpox	210	33.2	9.1	21.0	29.7	42.6	43.5
Measles	187	31.4	5.1	9.5	26.4	46.5	44.7
German measles	82	14.9	6.1	4.4	15.5	21.0	18.0
Mumps	38	6.2	--------	1.0	7.2	7.4	9.5
	Number of secondary cases	Secondary attack rate per 100 infants exposed [2] to case in household					
Whooping cough	55	72.7	--------	52.4	61.8	94.1	100.0
Chickenpox	124	67.2	14.3	48.9	78.0	77.1	76.5
Measles	33	23.7	6.2	8.1	8.0	35.7	43.5
German measles	27	24.8	--------	3.2	18.9	44.8	33.3
Mumps	25	14.2	--------	-------	17.4	14.3	25.0
	Total infant population observed [3]						
Full-time years of life	6,429.8		869.5	1,578.1	1,914.8	1,332.9	734.5
Communicable disease survey	4,697.7		738.8	1,315.0	1,484.3	874.3	285.2
5 other surveys	1,732.1		130.7	263.1	430.4	458.6	449.3
Number of individual infants	12,345		10,460	9,872	8,517	6,222	3,793
Communicable disease survey	9,199		8,893	8,271	6,737	4,328	1,918
5 other surveys	3,146		1,567	1,601	1,780	1,894	1,875
	Number of infants exposed [2] to case in household						
Whooping cough	96		17	21	34	17	6
Chickenpox	195		21	45	59	48	17
Measles	172		16	37	50	42	23
German measles	122		7	31	37	29	15
Mumps	204		9	49	69	56	20

[1] Adjusted = weighted average of rates for the different ages, the weights equalling the number of months in the age period; that is, 1 for under 1 month, 2 for 1–2 months, and 3 for the other 3 quarters. Numbers of cases are without correction for any factors discussed in note 3.

[2] "Exposed" refers to infants in attacked households minus primary cases among infants; the case to which exposed may have been a child or adult of any age. If 2 cases of any age were reported as having become sick on the same day, the first entry of such a case of the given disease in the list of communicable diseases that occurred during the study year was used as the "primary" case. A sample tabulation indicated that the order of the listing was not by age of the case. The use as primary cases of all cases with onset on the same day as the onset of the first case does not change the secondary attack rates or the age curves among infants in any material way.

The secondary attack rate data are all from the Communicable Disease Survey. The rate for all ages under 1 year is a weighted average (as described in note 1) of the rates in the different infant age groups. Since these data pertain only to secondary cases in households attacked by the disease, the epidemic situation (as discussed in note 3) in the general population presumably would not materially influence the results.

Cases with onset as much as 2 calendar months after the onset of the last preceding case were counted as a new series in the household.

[3] Surveys include the 5 listed in table 2 and the Communicable Disease Study (2, 3, 5, 6). The incidence rates in the latter study are corrected for the fact that the months of life observed became smaller as age increased and that in these older months of age the infants were exposed to different epidemic conditions than in the younger months of age. This situation arose from the fact that the data of the Communicable Disease Survey were collected at a single visit at the end of the study year and infants over 1 year of age at the end of the year were not recorded by month of age. Nevertheless, these infants had lived through various infant months of age during the study year but neither their months of observation nor the age at onset of a case could be tabulated by month of age.

The correction for the difference in epidemic exposure for different months of age which were unequally represented at the time of an epidemic was based on the distribution of cases of all ages in the four quarters of the study year, determined as follows: (a) the median date of the end of the study year for the different

ACTUAL RATES OF ILLNESS AND MORTALITY

The charts and discussion in the preceding pages have pertained largely to the similarities and differences between illness and mortality when considered on a relative basis. For example, age curves have carried scales of actual rates but the scales were adjusted so that the age curves for illness and mortality were comparable on a relative basis. Some attention should be paid to actual illness rates as compared with actual mortality rates for the few causes which are common to both the illness and mortality data here presented.

Although the illness data represent a relatively small sample and the mortality data include all deaths in the United States, in the absence of more precise information we may compute a rough estimate of the number of recorded cases per registered death. Considering first the four broad causes, the recorded case rate for malformations and diseases of early infancy amounts to only 2.4 times the death rate, reflecting an extremely high fatality for these serious conditions affecting infants mainly in the first few days of life. On the other hand, the recorded case rates for respiratory, digestive and the group of miscellaneous other diseases, amount to roughly 80 to 120 times the death rates for the corresponding disease groups. The case rate of illness from all causes amounts to 39 times the death rate, but if the case and death rates for malformations and diseases of early infancy

---

families was determined, and a date 6 months prior was taken as the middle of the survey year (about Nov. 1, 1935), (*b*) the cases for the 3 months on either side of the middle of the study year were used as the second and third quarters, (*c*) the cases outside of this 6-month period were used as the first and fourth quarters.

Since the bias existed only in the Communicable Disease Survey, the incidence rates for the different months of age were computed separately for this study. Furthermore, infants represented in the youngest months of observation were constantly being augmented by new births so these ages represented approximately the same exposure to epidemics throughout the study year and no correction was made for the groups under 3 months of age. However, infant observation time representing 3–5 months of age would begin only in the second quarter of the study year, since the only infants included were those born during the study year and none would reach 3 months of age until the second quarter of the study year. The correction factor for the age group 3–5 months was computed by taking the ratio of average cases (all ages) per quarter for the whole 4 calendar-quarters of the study year to the average cases per quarter for the last 3 quarters of the study year. The observed cases for the ages 3–5 months were multiplied by this adjustment factor to correct for varying seasonality or epidemicity of the disease. Thus if this ratio was 0.80 it meant that the average number of cases per quarter during the whole study year was only 80 percent of what it was during the 9 calendar months during which these months of age were lived. Thus the cases for this age group must be multiplied by 0.80 to make them comparable to reports for younger ages where the months observed were distributed approximately throughout the 12-month study year.

The months of life for the ages 6–8 months pertained only to the last 6 calendar months of the study year; for this age group the denominator in the computation of the adjustment factor was the average quarterly cases (all ages) for the last 2 quarters of the study year. Similarly, the months of life for the ages 9–11 months pertain only to the last 3 calendar months of the study year, so the denominator in the computation of the adjustment factor was the number of cases occurring in the last quarter of the study year. These corrections could have been made by single months but the quarterly correction seemed as precise as the data warranted.

Rates for the other 5 surveys as a single group were computed for the several infant age groups without correction; in these surveys ages were recorded in a way that permitted all observation time and cases occurring under 1 year of age to be tabulated by month of age. The total full-time years of life under 1 year of age observed in the Communicable Disease Survey constituted about 11/15 of the total for all 6 surveys, and in computing the incidence for all 6 surveys combined, the case rates for each infant age group for the Communicable Disease Study were weighted by 11 and those in the other group of surveys by 4. Then these rates for the different ages were adjusted as described in note 1 to obtain a rate for all ages under 1 year. However, the total numbers of cases listed in the first column of the incidence section are the totals recorded without correction of any kind.

The adjustment factors for the 3 age groups to which corrections were applied are listed in the following order for each disease: Ages 3–5, 6–8, and 9–11 months: whooping cough 1.04, 0.95, 0.90; chickenpox 0.95, 0.72, 0.64; measles 1.09, 0.82, 0.55; German measles 1.13, 0.87, 0.54; mumps 0.92, 0.69, 0.50.

The quarterly distributions of reported cases in the whole of the 28 surveyed cities during the year ending on the median date of the end of the survey were very similar to those of the survey cases of the same disease; therefore, adjustment factors based on reported cases instead of survey cases would be very similar to those given above.

are subtracted from the rates for all causes, the residual case rate is 100 times the residual death rate.

Considering a few more specific causes, there were about 10 cases of pneumonia per death and about 25 accident cases per death. For whooping cough and influenza there were somewhat over 100 cases per death, and for measles and ear and mastoid diseases more than 500 cases per death.

SUMMARY

A large volume of data is available on mortality during the first year of life but little is known about illness among infants. In a group of five sickness surveys in which there was a periodic canvassing of families, tabulations show illness rates for infants of different months of age during the first year of life. This paper presents these illness data with comparative figures on mortality among infants in the United States.

Infant mortality has steadily declined since the organization of the birth registration area in 1915 (fig. 1). The trend and actual values of the rates for white infants are almost identical in the Northeast, North Central, and Pacific sections of the country since about 1937. The South and particularly the Mountain region have higher rates than other sections but they show a definite downward trend since about 1937 (fig. 2).

For the country as a whole the trends of mortality among male and female infants are parallel but the rates for males are considerably above those for females. With respect to age, the mortality of the older months of the first year of life has declined more rapidly than that of the younger ages. Up to about 1936 there was practically no decline in the mortality under 1 day of age but that for 1–6 days has been decreasing for a longer period (fig. 2).

Infant mortality from all causes decreases sharply as age increases. This is true of malformations and diseases of early infancy and of all other causes (fig. 4). On the other hand, illness declines from a high rate under 1 month of age to a minimum at 1 month with an increase at least up to 6 months of age, beyond which the rate remains approximately the same (fig. 3).

Illness from digestive diseases has a moderately high peak under 1 month of age, as well as malformations and diseases of early infancy (fig. 5). However, the death rate from digestive diseases is low under 7 days of age, but there is a high peak for the ages 7–29 days. The mortality from three other broad disease groups declines rapidly with age (fig. 6).

The mortality from each of the four broad disease groups is consistently higher among male than female infants (fig. 8). Illnesses from communicable and digestive diseases do not show this tendency but rates for respiratory and all other diseases are rather consistently higher for males than females (fig. 7).

The chief causes of illness among infants are the common respiratory and digestive diseases, with whooping cough and ear and mastoid diseases also fairly high in the list. The chief causes of mortality are malformations and the various conditions associated with early infancy, but pneumonia and diarrhea and enteritis are fairly high in the list (fig. 9).

The age curves of illness during the first year of life vary greatly for different specific diseases (fig. 10). Mortality rates from specific causes tend to decrease more rapidly as age increases during the first year of life than is true of illness rates (fig. 11).

The incidence of the common communicable diseases tends to rise as age increases within the first year of life. Secondary attack rates among infants exposed to these diseases by household contact also rise with age, whooping cough and chickenpox having high rates after the first month of life but measles, German measles, and mumps having relatively low secondary attack rates throughout the first year of life (fig. 12).

Considering the important causes of illness and mortality at specific ages during the first year of life, the common respiratory diseases are frequent in all ages except the first month of life. Although pneumonia is the most important cause of infant deaths at all ages except the first month of life, it is relatively less frequent as a cause of illness (fig. 13).

REFERENCES

(1) Collins, Selwyn D.: The incidence of rheumatic fever as recorded in general morbidity surveys of families. Supplement No. 198 to the Public Health Reports (1947).

(*2*) ——: The incidence of poliomyelitis and its crippling effects, as recorded in family surveys. Pub. Health Rep. **61**: 327 (1946) (Reprint 2696).

(*3*) ——: Diphtheria incidence and trends in relation to artificial immunization with some comparative data for scarlet fever. Pub. Health Rep. **61**: 203 (1946) (Reprint 2693).

(*4*) ——: Age and sex incidence of influenza in the epidemic of 1943–44, with comparative data for preceding outbreaks. Pub. Health Rep. **59**: 1483 (1944) (Reprint 2586).

(*5*) —— and Councell, Clara: Extent of immunization and case histories for diphtheria, smallpox, scarlet fever, and typhoid fever in 200,000 surveyed families in 28 large cities. Pub. Health Rep., **58**: 1121 (1943) (Reprint 2495).

(*6*) ——, Wheeler, Ralph E., and Shannon, Robert D.: The occurrence of whooping cough, chickenpox, mumps, measles, and German measles in 200,000 surveyed families in 28 large cities. Special Study Series No. 1, Division of Public Health Methods, National Institute of Health, 1942 (Processed). Government Printing Office, Washington, 1943.

(*7*) ——: Cases and days of illness among males and females with special reference to confinement to bed. Pub. Health Rep. **55**: 47 (1940) (Reprint 2129).

(*8*) ——: Causes of illness in 9,000 families based on nation-wide periodic canvasses, 1928–31. Pub. Health Rep. **48**: 283 (1933) (Reprint 1563).

(*9*) ——: Infant mortality from different causes and at different ages in nine cities of the United States. Pub. Health Rep. 43: 392 (1928) (Reprint 1209).

(*10*) Linder, Forrest E., and Grove, Robert D.: Vital statistics rates in the United States, 1900–40. U. S. Bureau of the Census. Government Printing Office, 1943.

(*11*) Randall, Marian G.: Public health nursing service in rural families. Milbank Memorial Fund Quarterly, IX: 189 (Oct. 1931).

(*12*) Sydenstricker, Edgar: A study of illness in a general population group. Hagerstown Morbidity Studies No. 1: The method of study and general results. Pub. Health Rep. 41: 2069 (1926) (Reprint 1113).

(*13*) —— and Collins, Selwyn D.: Age incidence of communicable diseases in a rural population. Pub. Health Rep. 46: 100 (1931) (Reprint 1443).

(*14*) United States Bureau of the Census: Mortality summary—the infant, Vital Statistics Special Reports Vol. 16, No. 60, Bureau of the Census.

(*15*) United States Vital Statistics. Annual volumes, final reports, Government Printing Office.

(*16*) United States Vital Statistics, Special Reports, Bureau of the Census.

DEATHS DURING WEEK ENDED APRIL 17, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Apr. 17, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	8,977	9,701
Median for 3 prior years	9,109	
Total deaths, first 16 weeks of year	161,324	161,513
Deaths under 1 year of age	658	740
Median for 3 prior years	636	
Deaths under 1 year of age, first 16 weeks of year	11,080	12,815
Data from industrial insurance companies:		
Policies in force	71,083,995	67,303,781
Number of death claims	13,429	12,720
Death claims per 1,000 policies in force, annual rate	9.9	9.9
Death claims per 1,000 policies, first 16 weeks of year, annual rate	10.3	9.9

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED APRIL 24, 1948

Summary

Of 39 cases of poliomyelitis reported for the current week, as compared with 32 last week, 33 for the corresponding week last year, and 29 for the 5-year (1943–47) median, 24 occurred in 5 States—Texas 10 (last week 6), Indiana 5 (last week 1), and 3 each in Pennsylvania, Nebraska, and Alabama. Since March 20, the approximate average date of seasonal low incidence, 159 cases have been reported (last year 142; highest in past 6 years 156 in 1945, lowest 77 in 1942), half of which occurred in 5 States, as follows (last year's corresponding figures in parentheses): Texas 33 (10), California 17 (40), New York 12 (16), Indiana 9 (0), and North Carolina 9 (0).

The incidence of measles increased from 25,616 last week to 27,438, as compared with a 5-year median of 25,362 and 37,960, the highest for a corresponding week of the past 5 years (in 1946). The highest incidence, current and cumulative since the first of the year, as well as the greatest excess over last year's incidence, was reported in the Middle Atlantic and East North Central areas.

For the first time since November 1947, the weekly incidence of influenza dropped below the corresponding 5-year median. Of the total of 1,691 cases reported (last week 2,044, 5-year median 1,815), 1,254 were reported in the only States reporting more than 69 cases—Virginia, South Carolina, Oklahoma, and Texas.

Three cases of smallpox were reported—1 each in North Carolina, Wyoming, and Arizona. Colorado reported 1 case of Rocky Mountain spotted fever, and California 2 cases of leprosy.

Cumulative figures since the first of the year are above the corresponding median expectancies for amebic and undefined dysentery, infectious encephalitis, tularemia, and undulant fever.

Deaths totaling 9,210 were recorded during the week in 93 large cities of the United States, as compared with 8,977 last week, 9,434 and 9,448 respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 9,434. The total for the year to date (17 weeks ended April 24) is 170,534, as compared with 170,947 for the corresponding period last year. Infant deaths during the week totaled 659, as compared with 657 last week and a 3-year median of 631. The cumulative figure is 11,738, as compared with 13,548 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Apr. 24, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	Apr. 24, 1948	Apr. 19, 1947		Apr. 24, 1948	Apr. 19, 1947		Apr. 24, 1948	Apr. 19, 1947		Apr. 24, 1948	Apr. 19, 1947	
NEW ENGLAND												
Maine	0	2	1	1	8	------	21	184	64	0	0	0
New Hampshire	0	0	0	------	16	------	4	18	23	1	1	1
Vermont	1	0	0	------	------	------	11	231	118	0	0	0
Massachusetts	9	7	3	------	------	------	1,362	461	817	1	0	3
Rhode Island	0	1	1	------	3	3	8	357	24	0	3	2
Connecticut	0	0	1	6	8	2	124	758	447	0	2	3
MIDDLE ATLANTIC												
New York	8	23	21	[1] 5	[1] 4	[1] 2	2,327	447	2,314	8	6	32
New Jersey	3	5	5	8	14	7	1,378	391	1,545	2	2	3
Pennsylvania	6	11	11	(2)	(2)	[2] 1	1,658	204	966	2	4	14
EAST NORTH CENTRAL												
Ohio	6	2	8	2	27	8	1,213	879	879	5	5	6
Indiana	15	3	4	1	17	6	1,235	97	256	4	3	2
Illinois	1	1	5	2	23	9	1,882	104	808	5	2	11
Michigan [3]	0	5	7	3	13	3	1,411	43	944	3	2	6
Wisconsin	0	0	1	31	106	37	1,995	295	1,620	5	0	4
WEST NORTH CENTRAL												
Minnesota	6	7	7	1	2	1	660	188	188	2	4	3
Iowa	0	1	3	------	159	2	311	202	202	1	3	2
Missouri	1	2	2	14	4	4	340	36	331	2	3	9
North Dakota	1	0	1	------	7	7	16	5	9	0	0	0
South Dakota	0	4	1	------	------	------	51	42	24	0	0	0
Nebraska	0	3	2	12	31	2	402	------	198	0	0	1
Kansas	7	7	3	3	60	4	57	10	432	0	0	1
SOUTH ATLANTIC												
Delaware	0	1	0	------	2	------	74	1	15	0	1	1
Maryland [3]	10	2	9	4	13	3	215	28	107	3	5	5
District of Columbia	0	0	1	------	------	------	152	24	78	1	2	2
Virginia	3	5	5	207	3,242	159	149	232	425	0	5	8
West Virginia	6	1	2	5	202	11	251	65	67	1	1	2
North Carolina	1	12	7	------	------	------	36	159	191	1	4	4
South Carolina	13	10	3	272	2,151	288	165	256	341	1	1	1
Georgia	6	5	4	2	791	7	94	181	160	0	0	2
Florida	1	2	6	6	125	9	363	144	144	2	3	5
EAST SOUTH CENTRAL												
Kentucky	3	4	4	------	13	13	154	15	198	3	4	5
Tennessee	4	2	3	10	406	46	298	80	219	3	2	12
Alabama	*7	1	2	23	1,366	95	57	354	288	*2	0	1
Mississippi [3]	3	6	5	2	132	------	51	24	------	0	2	3
WEST SOUTH CENTRAL												
Arkansas	4	5	5	69	538	33	175	75	131	0	4	3
Louisiana	1	2	2	9	29	4	21	225	116	0	2	4
Oklahoma	1	0	2	115	717	52	48	5	86	1	1	2
Texas	11	16	27	660	1,774	756	3,134	329	611	6	7	7
MOUNTAIN												
Montana	2	0	1	16	51	2	74	164	132	0	0	0
Idaho	0	0	1	34	46	3	84	6	62	1	0	1
Wyoming	1	0	0	------	------	------	138	11	100	0	0	0
Colorado	3	7	7	42	88	19	650	77	511	2	0	1
New Mexico	1	0	0	------	3	3	26	63	63	0	0	0
Arizona	3	1	1	37	164	57	285	------	64	0	1	0
Utah [3]	12	1	0	------	86	2	227	10	228	0	0	0
Nevada	0	0	0	------	------	------	2	2	1	0	0	0
PACIFIC												
Washington	8	0	2	9	32	2	637	15	393	0	1	5
Oregon	0	3	3	32	112	18	133	24	120	1	6	4
California	12	14	18	42	31	43	3,279	189	1,139	7	5	23
Total	180	184	198	1,691	12,616	1,815	27,438	7,710	25,362	76	97	190
16 weeks	*3,159	4,432	4,432	127,745	278,753	180,632	278,171	90,810	288,308	*1,327	1,425	3,807
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	*9,517	11,998	13,131	171,303	311,728	311,728	313,117	113,697	326,321	*2,109	2,397	6,259

*Delayed report (included in cumulative totals only): Alabama, diphtheria 3, meningitis 2.

[1] New York City only.

[2] Philadelphia only.

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended Apr. 24, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	Apr. 24, 1948	Apr. 19, 1947		Apr. 24, 1948	Apr. 19, 1947		Apr. 24, 1948	Apr. 19, 1947		Apr. 24, 1948 [5]	Apr. 19, 1947	
NEW ENGLAND												
Maine	0	0	0	5	26	36	0	0	0	0	1	1
New Hampshire	0	1	0	2	10	13	0	0	0	0	3	1
Vermont	0	0	0	0	5	12	0	0	0	0	0	0
Massachusetts	0	0	0	227	126	299	0	0	0	5	4	2
Rhode Island	0	0	0	9	6	25	0	0	0	0	0	0
Connecticut	0	0	0	35	46	72	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	1	3	3	[6] 218	242	643	0	0	0	4	1	4
New Jersey	1	1	0	85	84	147	0	1	0	2	1	1
Pennsylvania	3	0	0	272	185	514	0	0	0	1	0	4
EAST NORTH CENTRAL												
Ohio	1	0	0	227	234	341	0	0	0	3	0	1
Indiana	5	0	0	52	100	100	0	1	0	0	2	0
Illinois	0	3	1	128	118	172	0	0	0	0	0	1
Michigan [3]	0	2	0	152	93	202	0	0	0	2	0	2
Wisconsin	0	0	0	69	69	176	0	0	0	1	0	0
WEST NORTH CENTRAL												
Minnesota	1	1	0	32	42	63	0	0	0	2	0	0
Iowa	2	1	0	22	30	56	0	0	0	0	2	2
Missouri	1	1	1	[6] 12	32	92	0	0	0	1	0	1
North Dakota	0	0	0	3	2	9	0	0	0	0	0	0
South Dakota	0	0	0	[6] 3	1	14	0	0	0	0	0	0
Nebraska	3	2	0	16	36	36	0	1	0	0	0	0
Kansas	0	0	0	31	36	64	0	0	0	0	0	1
SOUTH ATLANTIC												
Delaware	0	1	0	7	3	5	0	0	0	0	0	0
Maryland [3]	0	0	0	[6] 25	37	82	0	0	0	1	1	1
District of Columbia	0	0	0	8	7	36	0	0	0	0	0	0
Virginia	1	0	0	19	47	90	0	0	0	1	2	2
West Virginia	0	0	0	[6] 20	14	25	0	0	0	1	1	3
North Carolina	2	0	0	20	17	38	1	0	0	2	0	1
South Carolina	0	0	0	3	5	6	0	0	0	2	2	1
Georgia	0	0	0	20	11	11	0	0	0	0	1	3
Florida	0	2	2	5	8	8	0	0	0	7	0	2
EAST SOUTH CENTRAL												
Kentucky	0	0	0	22	23	47	0	0	0	5	2	2
Tennessee	1	0	0	19	32	58	0	0	0	1	2	2
Alabama	3	0	1	4	18	12	0	0	0	1	3	1
Mississippi [3]	0	1	1	2	4	4	0	1	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas	0	1	1	5	6	6	0	0	0	1	1	1
Louisiana	0	2	1	5	8	8	0	0	0	4	2	4
Oklahoma	0	0	0	11	9	19	0	2	0	1	0	1
Texas	10	4	3	29	20	58	0	4	1	2	3	7
MOUNTAIN												
Montana	1	0	0	7	7	8	0	0	0	0	1	0
Idaho	1	0	0	[6] 6	5	28	0	0	0	0	0	0
Wyoming	0	0	0	6	2	8	1	0	0	0	0	0
Colorado	0	0	0	30	38	52	0	0	0	0	0	0
New Mexico	0	0	0	5	7	9	0	0	0	0	0	0
Arizona	0	0	0	3	9	10	1	0	0	0	1	0
Utah [3]	0	0	0	16	17	30	0	0	0	0	0	0
Nevada	0	0	0	0	2	0	0	0	0	0	0	0
PACIFIC												
Washington	0	2	2	60	45	45	0	0	0	0	0	0
Oregon	0	0	0	12	26	35	0	0	0	2	0	0
California	2	5	5	82	126	180	0	0	0	6	3	3
Total	39	33	29	2,051	2,076	4,031	3	10	10	58	39	70
16 weeks	507	754	553	37,020	42,880	63,798	40	88	172	747	681	882
Seasonal low week [4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	159	142	137	59,559	69,566	102,119	61	142	255	274	196	284

---

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low weeks end. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately, as follows: Massachusetts (salmonella infection) 4; New Jersey 1; Michigan 1; Wisconsin 1; Virginia 1; California 4.

[6] Including cases reported as streptococcal sore throat.

Telegraphic morbidity reports from State health officers for the week ended Apr. 24, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended Apr. 24, 1948							
	Week ended—		Median 1943-47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Dec. 24, 1948	Dec. 19, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	25	17	25	---	---	---	---	---	---	---	---
New Hampshire	7	3	3	---	---	---	---	---	---	---	---
Vermont	39	8	11	---	---	---	---	---	---	---	1
Massachusetts	36	109	85	---	3	---	1	---	---	---	2
Rhode Island	1	7	14	---	---	---	---	---	---	---	---
Connecticut	21	35	35	---	---	---	---	---	---	---	2
MIDDLE ATLANTIC											
New York	99	142	164	17	1	---	2	---	---	---	7
New Jersey	59	152	117	2	---	---	---	---	---	---	---
Pennsylvania	60	128	128	---	---	---	---	---	---	---	---
EAST NORTH CENTRAL											
Ohio	39	133	99	4	---	---	---	---	---	---	5
Indiana	8	83	21	---	---	---	---	---	---	---	1
Illinois	52	86	68	10	3	---	3	---	1	---	7
Michigan [3]	62	134	89	2	---	---	---	---	---	---	10
Wisconsin	86	129	81	1	---	---	---	---	---	---	1
WEST NORTH CENTRAL											
Minnesota	15	19	19	1	---	---	---	---	---	---	4
Iowa	14	21	16	---	---	---	1	---	---	---	---
Missouri	17	28	19	---	---	---	---	---	---	---	1
North Dakota	---	1	1	---	---	---	---	---	---	---	---
South Dakota	10	---	2	---	---	---	---	---	---	---	1
Nebraska	3	20	6	2	---	---	---	---	---	---	1
Kansas	96	41	30	1	---	---	---	---	---	---	7
SOUTH ATLANTIC											
Delaware	1	---	---	---	---	---	---	---	---	---	---
Maryland [3]	11	68	68	---	---	---	---	---	---	---	1
District of Columbia	---	7	7	---	---	---	---	---	---	---	---
Virginia	56	53	53	---	---	51	---	---	---	---	3
West Virginia	10	35	35	---	---	---	---	---	---	---	---
North Carolina	38	34	133	1	1	---	---	---	---	---	---
South Carolina	91	135	61	---	4	---	---	---	---	1	---
Georgia	8	18	17	---	---	---	---	---	7	4	4
Florida	22	65	13	1	---	---	---	---	---	2	1
EAST SOUTH CENTRAL											
Kentucky	13	24	34	---	---	---	---	---	---	---	---
Tennessee	17	42	26	---	---	---	---	---	5	---	---
Alabama	71	84	48	(*)	---	---	---	---	---	5	1
Mississippi [3]	7	---	---	1	1	---	---	---	1	---	1
WEST SOUTH CENTRAL											
Arkansas	36	27	13	5	---	1	---	---	1	---	---
Louisiana	7	5	3	6	---	---	---	---	5	1	1
Oklahoma	47	21	20	2	---	---	---	---	---	---	---
Texas	452	539	268	10	350	50	---	---	3	2	4
MOUNTAIN											
Montana	13	13	6	---	---	---	---	---	---	---	---
Idaho	2	14	8	1	---	---	---	---	---	---	1
Wyoming	5	2	3	---	---	---	---	---	---	---	1
Colorado	47	39	39	---	---	---	---	1	---	---	3
New Mexico	33	10	10	1	---	---	---	---	---	---	---
Arizona	39	19	19	---	---	13	1	---	---	---	---
Utah [3]	17	2	39	---	---	---	---	---	2	---	2
Nevada	---	---	---	---	---	---	---	---	---	---	---
PACIFIC											
Washington	28	34	34	---	---	---	---	---	---	---	1
Oregon	44	23	19	14	---	---	---	---	---	---	2
California	88	271	271	8	1	---	---	---	---	---	6
Total	1,952	2,880	2,621	90	364	115	8	1	25	15	82
Same week: 1947	2,880	---	---	56	211	119	4	4	16	23	89
Median, 1943-47	2,621	---	---	34	258	65	10	3	11	35	[7] 89
16 weeks: 1948	34,858	---	---	*1,088	4,341	2,967	137	11	291	221	1,451
1947	41,069	---	---	753	4,823	3,290	105	16	541	637	1,654
Median, 1943-47	39,248	---	---	472	4,519	1,607	131	14	275	737	[7] 1,370

[3] Period ended earlier than Saturday.

[7] 3-year median 1945-47.

*Delayed report (included in cumulative totals only): Alabama, amebic dysentery 1.

Leprosy: California 2.

Territory of Hawaii: Rabies 0, measles 4, typhus fever (endemic) 1, whooping cough 18, outbreak of erythema infectiosum Hilo City and Honolulu.

WEEKLY REPORTS FROM CITIES*

City reports for week ended Apr. 17, 1948

This table lists the reports from 90 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	1	0	4	0	0	0	0	15
New Hampshire:												
Concord	0	0	------	0	1	0	1	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	2	0	------	0	400	1	8	0	92	0	0	4
Fall River	0	0	------	0	8	0	0	0	3	0	0	4
Springfield	0	0	------	0	6	0	0	0	1	0	0	------
Worcester	0	0	------	0	1	0	9	0	9	0	1	19
Rhode Island:												
Providence	0	0	------	0	------	0	1	0	1	0	0	1
Connecticut:												
Bridgeport	0	0	------	0	4	0	0	0	3	0	0	------
Hartford	3	0	------		------	0	2	0	1	0	0	1
New Haven	0	0	------	0	3	0	4	0	4	0	0	6
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	15	0	4	0	8	0	0	3
New York	2	0	6	2	1,674	3	46	1	90	0	1	43
Rochester	0	0	------	0	3	0	1	0	5	0	0	------
Syracuse	0	0	------	0	11	0	2	0	6	0	0	11
New Jersey:												
Camden	0	0	------	2	24	0	2	0	2	0	0	1
Newark	0	0	------	0	196	0	5	0	8	0	0	8
Trenton	0	0	3	0	4	0	1	0	4	0	1	3
Pennsylvania:												
Philadelphia	0	0	------	0	723	1	25	0	59	0	0	9
Pittsburgh	0	0	------	0	4	0	8	0	39	0	0	1
Reading	0	0	------	0	7	0	2	0	7	0	0	------
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	2	0	------	0	82	3	9	0	12	0	0	6
Cleveland	0	0	------	0	26	1	3	0	26	0	0	9
Columbus	2	0	------	0	58	0	2	0	7	0	0	------
Indiana:												
Fort Wayne	0	0	------	0	18	0	2	0	0	0	0	------
Indianapolis	2	0	------	0	135	0	12	0	8	0	0	8
South Bend	0	0	1	0	------	1	0	0	2	0	0	1
Terre Haute	0	0	------	0	------	0	1	0	0	0	0	------
Illinois:												
Chicago	1	0	2	0	778	1	22	0	45	0	0	21
Springfield	0	0	------		4	0	4	0	1	0	0	------
Michigan:												
Detroit	0	0	------	0	340	1	7	0	74	0	0	13
Flint	0	0	------	0	3	0	4	0	4	0	0	------
Grand Rapids	0	0	------	0	40	0	1	0	2	0	0	6
Wisconsin:												
Kenosha	0	0	------	0	75	0	0	0	2	0	0	------
Milwaukee	0	0	------	0	67	0	2	0	13	0	0	9
Racine	0	0	------	0	135	0	0	0	3	0	0	3
Superior	0	0	------	0	344	0	1	0	0	0	0	1
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	305	0	1	0	0	0	0	4
Minneapolis	0	0	------	0	39	0	6	0	6	0	0	1
St. Paul	1	0	------	0	43	0	4	0	8	0	0	2
Missouri:												
Kansas City	0	0	6	1	54	0	5	0	2	0	1	5
St. Joseph	0	0	------	0	3	0	0	0	2	0	0	------
St. Louis	2	0	------	1	276	1	6	0	16	0	0	8

* In some instances the figures include nonresident cases.

City reports for week ended Apr. 17, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	2	0	0	0	3	0	0	2
Nebraska:												
Omaha	0	0	------	1	151	0	0	0	1	0	0	1
Kansas:												
Topeka	0	0	------	0	20	0	2	0	0	0	0	------
Wichita	0	0	------	0	6	0	2	0	5	0	0	13
SOUTH ATLANTIC												
Deleware:												
Wilmington	0	0	------	0	11	1	2	0	2	0	0	------
Maryland:												
Baltimore	0	0	2	1	78	1	9	0	12	0	0	9
Cumberland	0	0	------	0	-------	0	0	0	1	0	0	------
Frederick	7	0	------	0	-------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	169	0	7	0	8	0	1	7
Virginia:												
Lynchburg	0	0	------	0	1	0	0	0	0	0	0	4
Richmond	0	0	------	0	-------	1	1	0	3	0	0	6
Roanoke	0	0	------	0	-------	0	0	0	0	0	0	------
West Virginia:												
Charleston	0	0	------	0	41	0	1	0	1	0	0	------
Wheeling	0	0	------	0	31	0	1	0	0	0	0	------
North Carolina:												
Raleigh	0	0	------	0	-------	0	0	0	0	0	0	1
Wilmington	2	0	------	0	-------	0	1	0	1	0	0	------
Winston Salem	0	0	------	0	1	0	1	1	0	0	0	1
South Carolina:												
Charleston	0	0	23	0	1	0	3	0	0	0	0	------
Georgia:												
Atlanta	0	0	------	0	3	0	3	0	2	0	0	1
Brunswick	0	0	------	0	-------	0	0	0	0	0	0	------
Savannah	0	0	------	0	1	0	0	0	3	0	0	3
Florida:												
Tampa	0	0	------	0	14	0	4	0	1	0	0	2
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	------	0	77	0	6	0	3	0	0	2
Nashville	0	0	------	1	5	0	2	0	1	0	0	2
Alabama:												
Birmingham	0	0	------	0	3	0	1	0	1	0	0	4
Mobile	0	0	11	0	-------	0	0	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	1	0	9	0	1	0	0	0	0	------
Louisiana:												
New Orleans	0	0	6	2	4	0	2	0	3	0	3	1
Shreveport	0	0	------	0	-------	0	1	0	0	0	0	------
Texas:												
Dallas	2	0	------	0	152	0	2	0	4	0	0	1
Galveston	0	0	------	0	1	0	2	0	0	0	0	------
Houston	1	0	------	0	1	0	5	0	0	0	0	1
San Antonio	0	0	------	0	33	1	3	0	2	0	0	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	1	0	2	0	0	0	0	4
Great Falls	0	0	------	0	3	0	0	0	1	0	0	2
Helena	0	0	------	0	-------	0	0	0	0	0	0	------
Missoula	0	0	------	0	-------	0	0	0	0	0	0	------
Idaho:												
Boise	0	0	------	0	-------	0	0	0	0	0	0	------
Colorado:												
Denver	1	0	4	0	381	1	5	0	5	0	0	17
Pueblo	0	0	------	0	12	0	5	0	1	0	0	4
Utah:												
Salt Lake City	0	0	------	0	40	0	2	0	4	0	0	2

City reports for week ended Apr. 17, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	63	0	5	0	12	0	0	11
Spokane	0	0	3	0	5	0	1	0	1	0	0	------
Tacoma	0	0	------	0	45	0	0	0	0	0	0	------
California:												
Los Angeles	2	0	5	0	302	0	3	1	19	0	0	4
Sacramento	0	0	------	0	13	0	1	0	1	0	0	------
San Francisco	3	0	4	0	301	0	5	0	8	0	0	7
Total	36	0	77	11	7,891	18	308	3	684	0	8	339
Corresponding week, 1947	71	------	566	51	1,710	------	499	------	641	4	6	636
Average 1943–47	71	------	163	[1] 29	[2] 6,969	------	[1] 391	------	1,538	1	12	642

[1] 3-year average 1945–47.

[2] 5-year median 1943–47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 90 cities in the preceding table (latest available estimated population, 34,394,800)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Tyhpoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	13.1	0.0	0.0	0.0	1,108	2.6	75.8	0.0	298	0.0	2.6	131
Middle Atlantic	0.9	0.0	4.2	1.9	1,232	1.9	44.4	0.5	106	0.0	0.9	3
East North Central	4.3	0.0	1.8	0.0	1,280	4.3	42.6	0.0	121	0.0	0.0	4
West North Central	6.0	0.0	11.9	6.0	1,788	2.0	51.7	0.0	86	0.0	2.0	7
South Atlantic	14.7	0.0	40.9	1.6	574	4.9	53.9	1.6	56	0.0	1.6	5
East South Central	5.9	0.0	64.9	5.9	502	0.0	53.1	0.0	30	0.0	0.0	4
West South Central	8.6	0.0	20.1	5.7	574	2.9	45.9	0.0	26	0.0	8.6	1
Mountain	7.9	0.0	31.8	0.0	3,471	7.9	111.2	0.0	87	0.0	0.0	23
Pacific	7.9	0.0	19.0	0.0	1,153	0.0	23.7	1.6	65	0.0	0.0	3
Total	5.5	0.0	11.7	1.7	1,200	2.7	46.8	0.5	104	0.0	1.2	5

Dysentery, amebic.—Cases: Boston 1; New York 16; Washington 1; New Orleans 2; Dallas 1.
Dysentery, bacillary.—Cases: Worcester 1; New York 1; Charleston, S. C. 1; Los Angeles 1.
Dysentery, unspecified.—Cases: Cincinnati 2; Baltimore 2; San Antonio 2.
Tularemia.—Cases: New Orleans 2.
Typhus fever, endemic.—Cases: Birmingham 1; Mobile 1.

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—5 weeks ended April 3, 1948.—During the 5 weeks ended April 3, 1948, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chickenpox	82	Syphilis	171
Diphtheria	66	Tetanus	10
Dysentery, unspecified	3	Tetanus, infantile	1
Gonorrhea	332	Tuberculosis (all forms)	981
Influenza	38	Typhoid fever	8
Malaria	183	Typhus fever (murine)	3
Measles	1,558	Whooping cough	132
Poliomyelitis	1		

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended April 3, 1948.—During the week ended April 3, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		15	1	150	495	45	20	28	44	798
Diphtheria				6	2		1			9
Dysentery, bacillary				1						1
German measles				37	38		4	10	3	92
Influenza		21			11				7	39
Measles			1	747	1,321	13	5	16	59	2,162
Meningitis, meningococcus		1		2			1			4
Mumps		12	1	235	228	25	54	21	5	581
Poliomyelitis		2				1				3
Scarlet fever		5		93	121	1	1	6	5	232
Tuberculosis (all forms)		9	13	113	35	19	19	31	22	261
Typhoid and paratyphoid fever		1		8	1					10
Undulant fever					3		1	4	1	9
Venereal diseases:										
Gonorrhea	1	12	18	95	72	27	10	43	53	331
Syphilis		17	14	66	49	13	4	3	14	180
Whooping cough				28	24	3	1	25	5	86

JAMAICA

Notifiable diseases—5 weeks ended April 3, 1948.—During the 5 weeks ended April 3, 1948, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities
Cerebrospinal meningitis		1
Chickenpox	7	17
Diphtheria	3	3
Dysentery	1	1
Erysipelas	1	
Leprosy		1
Tuberculosis (pulmonary)	48	49
Typhoid fever	5	62

JAPAN

Notifiable diseases—5 weeks ended April 3, 1948, and total reported for the year to date.—For the 5 weeks ended April 3, 1948, and for the year to date, certain notifiable diseases were reported in Japan as follows:

Disease	5 weeks ended April 3, 1948		Total reported for the year to date	
	Cases	Deaths	Cases	Deaths
Diphtheria	1,894	177	5,553	595
Dysentery, unspecified	332	57	614	131
Gonorrhea	28,226	----------	64,174	----------
Influenza	514	----------	1,383	----------
Malaria	285	5	778	6
Measles	7,410	----------	14,426	----------
Meningitis, epidemic	303	78	637	157
Paratyphoid fever	144	7	445	24
Pneumonia	20,791	----------	55,060	----------
Scarlet fever	205	4	662	8
Smallpox	2	0	8	0
Syphilis	26,834	----------	58,237	----------
Tuberculosis	32,395	----------	77,167	----------
Typhoid fever	420	66	1,381	183
Typhus fever	59	4	241	20
Whooping cough	3,185	----------	10,214	----------

Note.—The above figures have been adjusted to include delayed and corrected reports.

NEW ZEALAND

Notifiable diseases—4 weeks ended April 3, 1948.—During the 4 weeks ended April 3, 1948, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	7	1	Malaria	1	----------
Diphtheria	19	2	Poliomyelitis	70	3
Dysentery:			Puerperal fever	2	----------
Amebic	3	----------	Scarlet fever (including streptococcal sore throat)	77	1
Bacillary	57	3			
Erysipelas	10	----------	Tetanus	2	1
Food poisoning	11	----------	Trachoma	1	----------
Influenza	1	----------	Tuberculosis (all forms)	164	47
Lead poisoning	1	----------	Typhoid fever	9	----------

TUNISIA

Notifiable diseases—Year 1947.—During the year 1947, cases of certain notifiable diseases were reported in Tunisia as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	19	Rabies	3
Diphtheria	87	Relapsing fever	22
Dysentery, amebic and bacillary	20	Scarlet fever	33
Leprosy	3	Smallpox	1,203
Malaria	14,068	Tuberculosis	734
Measles	117	Typhoid and paratyphoid fever	806
Mediterranean fever	2	Typhus fever	705
Mumps	61	Whooping cough	32
Poliomyelitis	7		

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

Cholera

India—Calcutta.—Cholera has been reported in Calcutta, India, as follows: For the week ended April 10, 1948, 343 cases with 118 deaths; for the week ended April 17, 1948, 292 cases.

Indochina (French)—Cochinchina.—Cholera has been reported in Cochinchina, French Indochina, as follows: For the period April 1–10, 1948, 115 cases of cholera with 85 deaths were reported in Cochinchina, French Indochina, and for the week ended April 10, 1948, 24 cases of cholera were reported in Saigon-Cholon, Cochinchina, French Indochina.

Plague

India.—Plague has been reported in India as follows: During the week ended April 17, 1948, 5 deaths from plague (confirmed) were reported in Calcutta, India; during the week ended April 24, 1948, 28 suspected cases of plague were reported in Calcutta. For the week ended April 3, 1948, 23 cases of plague with 10 deaths were reported in Lucknow, India, and for the week ended April 10, 1948, 16 cases of plague were reported in Lucknow.

Information dated April 14, 1948, states that an outbtrak of plague began in Jubbulpore City, Central Provinces, India, in January 1948. On March 30, 1948, 18 cases with 8 deaths were reported to have occurred within the preceding 48 hours. The total number of cases reported to that date (March 30) was 149, with 75 deaths. Necessary precautions were being taken.

Smallpox

China—Shanghai.—Smallpox has been reported in Shanghai, China, as follows: For the week ended April 10, 1948, 115 cases of smallpox were reported; for the week ended April 17, 1948, 97 cases of smallpox were reported.

India—Calcutta.—For the week ended April 10, 1948, 280 cases of smallpox with 227 deaths were reported in Calcutta, India, and for the week ended April 17, 1948, 207 cases were reported.

Indochina (French)—Cochinchina—Saigon.—For the week ended April 10, 1948, 24 cases of smallpox were reported in Saigon, Cochinchina, French Indochina.

Typhus Fever

Bolivia—La Paz Department—La Paz.—For the week ended April 3, 1948, 12 cases of typhus fever were reported in LaPaz, La Paz Department, Bolivia.

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948
For sale by the Superintendent of Documents, Washington 25, D. C.
Price 10 cents. Subscription price $4.00 a year

Public Health Reports

VOLUME 63 MAY 21, 1948 NUMBER 21

IN THIS ISSUE

State-Local Grant-in-Aid Formulas

Age Selection of Fatal Poliomyelitis

Immunization Against Shigella Infection

Sickness Absenteeism, Third and Fourth Quarters, 1947

Murine Typhus in Lavaca County, Texas

1798

FEDERAL SECURITY AGENCY

PUBLIC HEALTH SERVICE

FEDERAL SECURITY AGENCY
OSCAR R. EWING, *Administrator*

PUBLIC HEALTH SERVICE
LEONARD A. SCHEELE, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS
G. ST. J. PERROTT, *Chief of Division*

CONTENTS

Page
State-local grant-in-aid formulas. A. L. Chapman and Clifford Greve — 673
Changes in age selection of fatal poliomyelitis. Alexander G. Gilliam — 677
Studies in acute diarrheal diseases. XIX. Immunization in Shigellosis. A. V. Hardy, Thelma DeCapito, and Seymour P. Halbert — 685
Sickness absenteeism among industrial workers, third and fourth quarters of 1947. W. M. Gafafer — 689
Distribution of endemic typhus in rats in Lavaca County, Tex. J. V. Irons, J. N. Murphy, Jr., and David E. Davis — 692

INCIDENCE OF DISEASE

United States:

  Reports from States for week ended May 1, 1948, and comparison with former years — 695

  Weekly reports from cities:

    City reports for week ended April 24, 1948 — 699
    Rates, by geographic divisions, for a group of selected cities — 701

  Territories and possessions:

    Virgin Islands of the United States—Notifiable diseases—January–March 1948 — 701

Foreign reports:

  Canada—Provinces—Communicable diseases—Week ended April 10, 1948 — 702

  Cuba—

    Habana—Communicable diseases—5 weeks ended April 3, 1948 — 702
    Provinces—Notifiable diseases—5 weeks ended April 3, 1948 — 702
  Finland—Notifiable diseases—February 1948 — 703

  Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—

    Cholera — 703
    Plague — 703
    Smallpox — 704
    Typhus fever — 704
Deaths during week ended April 24, 1948 — 704

Public Health Reports

Vol. 63 • MAY 21, 1948 • *No. 21*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

STATE–LOCAL GRANT–IN–AID FORMULAS

By Dr. A. L. Chapman, *Assistant Chief, States Relations Division,* and Clifford Greve, *Statistician, States Relations Division, Public Health Service*

The shift from a relatively simple, local, agrarian economy to a broad, complex industrial one has accentuated the need for additional financial assistance to local governments. This change in the general economy has altered the basic tax structure of the United States in such a way as to make it relatively difficult for local governments to obtain sufficient local revenue to maintain adequate governmental activities to protect and serve the individuals of the community. The development of local health departments indicates that financial support from other than local tax funds has characterized the public health movement from early in its history. Lack of local revenues is the prime reason that the majority of local health departments now depend, in some degree, upon funds from other sources for the operation of some part of their program.

Protection of all communities from becoming foci in the spread of disease requires that the additional necessary revenues be supplied to communities with inadequate resources through some form of outside financial assistance such as grants-in-aid. Local tax bases may be such that the appropriation of as much as five dollars per capita to support a local health department might not work too great a hardship on local tax resources in some communities, while in other areas, a per capita local levy of 50 cents for this purpose would constitute an extremely heavy fiscal burden. The primary source of financial assistance to the communities lacking local fiscal resources is obviously from revenues collected from tax sources that are not taxable by local governments.

In addition to financial need, there are two other considerations that loom important as reasons for making grants to local health departments. The first is that financial assistance from higher governmental levels stimulates local groups to develop health programs and expand existing ones on a sound basis (*1*). Secondly, such participation of State governments in a program of financial assistance to the local health departments encourages the provision of a more uniformly high standard of service.

The most important, as well as the most difficult problem in connection with the sharing of Federal and State revenues with units of local government is the method of distribution (*1*). A recent survey of State-local allocation formulas shows that only ten States have developed formulas, most of which are not truly objective (*2*). In many instances such funds are distributed on the basis of administrative decisions made at the State level after a subjective evaluation of local public health needs. Apportioning funds in this patternless manner often favors some local units at the expense of others and may result in the development of an unscientific "first come—first served" type of distribution (*3*). Today, however, the demand for full-time local health services creates the need for a scientific and equitable allocation formula to be applied to grants-in-aid. Objective methods of distribution assure State legislators, State administrators, and local health officers that the apportionment of State and Federal funds to communities of the State is free from bias or personal influence.

Sensing this impending need for objective methods of distributing grants-in-aid, North Carolina, Michigan, California, Washington, Illinois, Florida, Tennessee, Georgia, New York, and Louisiana pioneered in the development of State-local allocation formulas in the field of public health. Review of these State formulas indicates a wide variation in their basic patterns of distributing grants-in-aid to local health departments. Several of the States use numerous factors, each separately weighted in the formula, while other States base the distribution on single factors which only partially measure the service requirements of each community, the local community's financial ability to finance its health program, and the need for financial assistance from State or Federal tax resources.

It is doubtful if a single method of allocation is desirable, or could be devised, which would be applicable to the problems of all States. The experience of these 10 States and the several Federal agencies which have administered grant-in-aid programs indicates the impracticability of uniformity in the details of allocation. There are, however, certain broad principles that administrative agencies have found generally applicable to methods of distributing grants-in-aid on the Federal-State or State-local level.

The consideration of these basic principles in the formulation of allocation methods aids materially in keeping the plan of distribution simple and yet objective. The grant to each local health department should be related to the volume of services to be rendered, the community's financial resources to pay for these services, and the need of the local area for financial assistance (*4*). To achieve this end, each local health department should submit an annual plan of action to the State health department prior to the allotment of State and Federal funds (*5*). Moreover, methods of allocation should permit long range planning and encourage increasing local financial participation (*6*). The differences in the number of services to be rendered and the financial ability of local areas create the need for a variable allocation formula which will distribute grants-in-aid in such a way as to equalize the financial burden among grantees (*7*). Doctor Kahl, the Director of Local Health Services for the State of Washington, indicates that allocation plans should be applicable only to full-time local health units when he says, "If the plan is applied only to full-time health departments, as it should be, it will stimulate their development, and will further assist in developing them in accordance with the State over-all plan for complete coverage by full-time health services" (*6*). The formula should be such that local health units which serve as training areas receive adequate compensation for training programs in addition to the regular allotment they receive by formula. This is necessary since personnel used in training devote part of their time to teaching.

There are two important administrative requirements that enter into the successful administration of a grant-in-aid program. Records and reports from local health departments are necessary to the grantor since they serve as a gross quantitative measure of operations and a means of evaluating their efficiency (*7*). Also, to insure a high quality of personnel, the grantor should require that personnel whose salary is paid in whole or in part from grants-in-aid should be selected through some type of merit system.

Simplicity is perhaps the most important general principle which should govern the development of an allocation plan. Measures of service requirements, fiscal ability, and the need for financial assistance should be the simplest that are available. Complex mathematical techniques should be avoided, insofar as possible. Administrative adjustments should be omitted or, at least, kept at a minimum since their use defeats the fundamental purpose of a formula.

What are some of the factors that may be used in measuring the number of health services needed, the fiscal ability of local communities to finance the necessary health activities, and the need for financial assistance from the State or Federal government?

Population is perhaps the most valid measure of the services required of a local health department (*9*). The number of people living in an area largely determines the size of the staff; number of clinics; and number of services, such as nursing visits, sanitary inspections, laboratory examinations, immunizations, and maternal and child health services that are necessary in the community. Population is a very broad measure of health needs, but a valid one, nevertheless.

Density of population, or the accessibility of health departments to the people, is a factor to be considered in allocation formulas. Sparsely populated areas, areas of small populations that cannot combine with other counties, and inaccessible terrain contribute to higher administrative operational costs. The use of a measurement of these factors in an apportionment formula usually results in a lump-sum grant to certain local areas, modified perhaps in relation to a measure of the need for financial assistance. Somewhat the same goal may be achieved more simply by making an equal minimum grant to each local health department as a part of a variable formula.

Measurements of need for financial assistance and the fiscal capacity of local governments present two of the most troublesome problems connected with the distribution of grants-in-aid (*10*). Per capita income accruing to residents of an area, while not normally taxable by local government, does reflect the local economic level and may be used as a measure of local fiscal capacity to finance local governmental functions. Since local taxation is essentially based upon real estate evaluation, measures of fiscal capacity of local governments may be calculated from assessed valuations, tax yield of a uniform tax rate, etc., providing there is an annual equalization of assessments within the State (*11*). Also, the need of the local governments for financial assistance from other than local tax revenues may be measured by the inverse function of these same factors.

The factors used in allocation formulas should be applicable to objective measurement and should be based upon dependable data, collected, insofar as possible, by official agencies. Factors should be assigned weights and used mathematically to grant proportionately greater assistance to localities having insufficient local financial resources or more than average service requirements, and proportionately less to areas of superior fiscal capacity or less than average need for service.

The Public Health Service stands ready, on a consultant basis and insofar as personnel are available, to assist individual States in making an approach to this problem of allocating grants-in-aid to local health units through use of a formula.

SUMMARY

Although State health officers have shown a commendable awareness of the need for developing a formula for the allocation of State and Federal funds as grants-in-aid to local health units, they have approached this problem with a conservatism that was warranted by the complexity of the local factors involved. Patterns are now being evolved whereby there may be developed simple, but adequate, grant-in-aid formulas which will be sufficiently flexible to be used in almost any State.

REFERENCES

(*1*) Spicer, George W.: Fiscal aspects of State-local relations. The Annals of the American Academy of Political and Social Science. **207**: 151–160 (1940).

(*2*) American Public Health Association: Allocation of Public Health Funds. (Formulae or criteria used by certain States in allocating State and Federal funds to local health departments.) January 1947. Mimeographed copies are available through the American Public Health Association in New York City.

(*3*) Harris, Joseph P.: The future of Federal grants-in-aid. The Annals of the American Academy of Political and Social Science. **207**: 14–26 (1940).

(*4*) Mountin, Joseph W. and Sibley, Elbridge: Apportionment of financial aid for county health work. Pub. Health Rep. **45**: 1–10. (1930).

(*5*) Key, V. O., Jr.: The Administration of Federal grants to States. Public Administration Service. Chicago. p. 64. (1937).

(*6*) Kahl, John A.: Criteria for the allocation of subsidy to local health departments. Am. J. Pub. Health. **37**: 199–204 (1947).

(*7*) Newcomer, Mabel: An index of taxpaying ability of State and local Governments. Columbia University Press. New York. p. 12. (1935).

(*8*) Mountin, Joseph W. and Flook, Evelyn: Devices for reducing health department records and reports. Pub. Health Rep. Supplement No. 187, pp. 1–8. (1945).

(*9*) Wueller, P. H.: Income and the measurement of relative capacities of the States. Studies in income and wealth. National Bureau of Economic Research Vol. **3**. (1939).

(*10*) Leland, Simeon E.: The relation of Federal, State, and local finance. Proceedings of the twenty-third Annual Conference on Taxation. National Tax Association. pp. 95–97 (1931).

(*11*) Morrison, Henry C.: School Revenues. The University of Chicago Press. Chicago. pp. 172–173 (1930).

CHANGES IN AGE SELECTION OF FATAL POLIOMYELITIS [1] [2]

By ALEXANDER G. GILLIAM, *Senior Surgeon, Public Health Service*

INTRODUCTION

In 1930, Forsbeck and Luther, (*1*) in a statistical study of the cases of poliomyelitis reported in Massachusetts from 1912 through 1929, called attention to a relative shift in age selection of the disease in the period following 1918. During this interval the percentage of cases reported in children under 5 years of age markedly decreased while there was compensatory increase in the percentage of cases in the age group 5–14. In the 15–19 age class, and in adult life, the percentage of cases remained constant. Though Forsbeck and Luther made no specific mention of the fact, it is presumed that the bulk of their reported cases were paralytic, certainly those prior to about 1927 (*2*).

The following year Limper, Thelander, and Shaw (*3*), in a clinical study of poliomyelitis in adults affected in the California 1930 outbreak, noted a higher percentage of cases reported among urban residents 15 years of age and older than was observed in the 1927 outbreak. However, there was no change in the percentage of cases in this age group among cases from rural areas. No mention is made as to whether or not the two epidemics differed in proportion of paralytic cases reported, but of the 60 adults studied clinically in 1930, 18 percent were nonparalytic.

---

[1] From the Department of Epidemiology, School of Public Health, University of Michigan.

[2] Aided by a grant from the National Foundation for Infantile Paralysis, Inc.

In 1932, Knowlton (*4*) noted, in the Connecticut epidemic of 1931 as compared with the period 1921–30, an increased percentage of cases in persons over 5 years of age. The relative increase, however, was in the 5–14 age group and the percentage of cases in those 15 years of age and older was slightly less in 1931. In Knowlton's opinion a much greater number of nonparalytic cases was reported in 1931 than previously recorded.

Das (*5*) noted a similar phenomenon with respect to deaths attributed to poliomyelitis in the Death Registration States of 1910 in the period 1910–28. His published figures deal with the percentages of total deaths in the group under 5 years of age and show a decided decrease in these percentages during the 19-year period.

In recent years data such as those mentioned, as well as other studies (*6–13*) have been interpreted by some to "point to a general increase in the tendency of poliomyelitis to attack the higher age groups" (*14*). As implied in this statement, it appears to be generally believed in this country that there has been a progressively increased incidence of poliomyelitis in the older ages. It is clear, from the work mentioned, that a *relative* shift in age selection of *reported* cases and deaths has occurred, but it does not necessarily follow that there has been any actual tendency towards increase in attack rates or death rates in the older ages.

Any effort to distinguish between a relative and an absolute shift in age selection of poliomyelitis in the United States over any period of years after the late 1920's is limited because of changes in criteria of diagnosis of reported cases which have been in progress in this country since about 1927 and greatly accelerated since the early 1930's. Since there is some evidence that there may be a different age distribution of paralytic and nonparalytic cases in this country (*15*, *16*), it would appear important that cases compared in different years be of the same general type. Thus, the value of the comparison made between the percentage age distribution of cases in New York City in 1916 with that in 1931 is limited, since virtually 100 percent of the cases reported in 1916 were paralytic while only 43 percent of those in 1931 were paralytic (*17*). In more recent years the proportion of paralytic cases reported in the United States has varied considerably from time to time and from place to place (*18*).

On the other hand there appears to be little reason to believe that there has been, since about 1916, a very marked change in criteria of diagnosis in reported fatal cases of poliomyelitis. Therefore, an attempt is here made to distinguish between relative and absolute shifts in age selection of reported fatal poliomyelitis. It is recognized that changes noted in fatal poliomyelitis are not necessarily applicable to the nonfatal disease.

SOURCE OF DATA

The deaths attributed to poliomyelitis in the 20 Death Registration States[3] of 1910 for the years 1910 through 1940 have been analyzed. Since Das' study (*5*), 12 more years of experience are available as well as two censuses of population. Thus, it is now possible to compute age specific death rates and not deal with percentages of deaths as Das was forced to do.

The 20 Death Registration States of 1910 were selected for the same reasons that probably motivated Das. First, although there undoubtedly has been some change, between 1910 and 1940, in criteria of diagnosis of fatal poliomyelitis, such change is likely to be small in comparison with changes in criteria of diagnosis of reported cases. Second, the Death Registration States of 1910 comprised, in 1940, 53 percent of the population of the United States. In addition, from 1933 to 1940, 45 percent of the deaths from poliomyelitis were recorded from these 20 States.[4] Third, since deaths recorded from the same States have been used throughout the period 1910–40, the influence of latitude, shown by Doull (*19*) to affect the age selection of poliomyelitis, has been kept constant.

One factor influencing the age selection of poliomyelitis is not kept constant in these data. Since Frost's observation in 1913 (*20*), a number of other studies have demonstrated the tendency for paralytic poliomyelitis to select older ages in rural populations. In the period comprising this study there has been in the entire United States a tendency toward urbanization of population which of itself might affect age selection. Thus, in 1910, 53.6 percent of the population of the United States was classified as rural, and in 1940, 43.5 percent.

The urban and rural populations for the 20 States comprising this study are given in table 1. It is noted that in these States there is a similar tendency toward urbanization though it is not nearly so marked as for the entire United States. Thus, in these States 36.9 percent of the inhabitants were classified as rural in 1910 and 30.8 percent in 1940.

In recent years some workers have noted that differences in age incidence of poliomyelitis between rural and urban populations have

---

[3] The States included are California, Colorado, Connecticut, Indiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Utah, Vermont, Washington, and Wisconsin.

[4] Between 1929 and 1940, when reports of poliomyelitis deaths for the entire United States are available either from Bureau of the Census reports, or from The Notifiable Diseases, 51 percent was reported from these 20 States.

TABLE 1.—*Enumerated population at censuses of 1910 and 1940 for 20 Death Registration States of 1910*

	1910		1940	
	Number	Percent	Number	Percent
All ages:				
Urban [1]	29,614,009	63.1	48,605,261	69.2
Rural	17,305,615	36.9	21,590,801	30.8
Total	46,919,624	100.0	70,196,062	100.0
Under 5 years of age:				
Urban [1]	2,937,551	60.7	3,170,598	63.4
Rural	1,903,689	39.3	1,827,404	36.6
Total	4,841,240	100.0	4,998,002	100.0

[1] Incorporated places of 2,500 inhabitants or more are classified as urban.

often disappeared (*14*) though no mention is made as to whether the cases compared are paralytic. Whether or not this is generally true in this country today awaits documentation based upon comparisons of a number of series of cases where similar diagnostic criteria have been applied to the paired series. In Sweden (*21*), at least, the age selection of poliomyelitis is still different in urban and rural populations in the same fashion as formerly noted in this country.

TABLE 2.—*Age specific poliomyelitis death rates per 100,000 population, in the 20 Death Registration States of 1910, for the years 1910–40, inclusive*

[Death rate per 100,000 population]

Year	Age groups				Crude rate, all ages	All ages, adjusted rate [1]
	0-4	5-9	10-19	20 and over		
1910	16.7	5.0	2.0	0.4	2.8	2.8
1911	11.2	2.7	1.1	.3	1.8	1.8
1912	12.3	3.0	1.1	.3	2.0	1.9
1913	7.3	2.6	.9	.3	1.4	1.4
1914	5.5	1.7	.8	.3	1.1	1.1
1915	5.5	1.3	.9	.3	1.0	1.0
1916	86.2	23.6	5.8	1.1	12.9	12.9
1917	7.6	2.2	1.0	.2	1.3	1.3
1918	5.4	2.0	1.0	.3	1.1	1.1
1919	3.7	1.4	.7	.2	.8	.8
1920	4.4	1.8	.8	.2	.9	.9
1921	7.5	5.4	2.6	.4	2.0	2.0
1922	4.2	1.6	.9	.2	.9	.9
1923	4.3	1.4	.9	.2	.8	.9
1924	5.1	2.9	1.8	.3	1.3	1.3
1925	5.6	3.8	2.4	.4	1.6	1.6
1926	3.3	1.4	1.1	.2	.8	.8
1927	7.3	5.4	2.7	.4	1.9	2.0
1928	4.8	3.7	2.1	.3	1.3	1.4
1929	2.7	1.4	.8	.2	.6	.7
1930	3.7	2.7	1.8	.3	1.1	1.2
1931	9.2	6.9	3.4	.5	2.4	2.5
1932	2.9	1.9	1.0	.1	.7	.7
1933	1.9	1.8	1.2	.2	.6	.7
1934	1.4	1.3	1.3	.2	.6	.6
1935	2.1	2.2	1.5	.3	.8	.9
1936	1.1	1.0	.6	.2	.4	.4
1937	2.1	2.2	1.7	.3	.8	.9
1938	.8	.5	.4	.1	.2	.3
1939	.7	1.5	1.2	.3	.5	.6
1940	1.2	1.8	1.2	.3	.6	.7

[1] Adjusted to age distribution of 1910 population, as standard.

RESULTS

In table 2 are given age specific death rates [5] for poliomyelitis per 100,000 estimated population, in the Death Registration States of 1910, and death rates for all ages adjusted to the age distribution of the

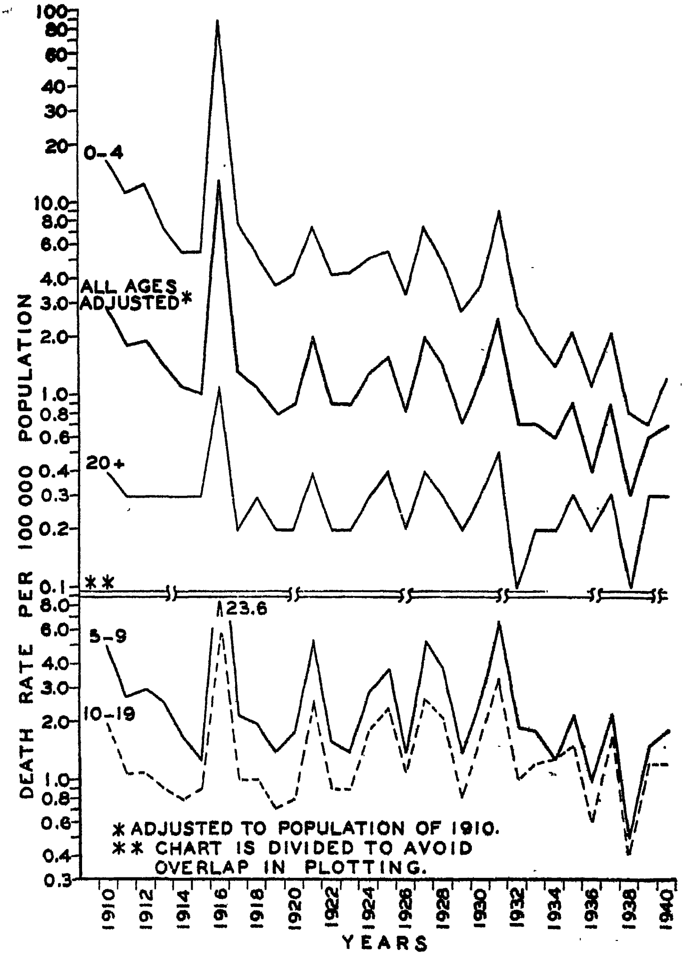


FIGURE 1.—Trend of mortality from poliomyelitis, 1910–40. Age specific death rates in 20 Death Registration States of 1910

population of 1910 as a standard. These data are shown graphically in figure 1. It is noted, that the trend of poliomyelitis, as measured by mortality rates, has been altered abruptly by epidemic excursions eight times between 1910 and 1940. The general trend of mortality, however, has been downward during this period,[6] though from about 1920 to 1932 the trend in total rates remained somewhat stationary except for the four epidemic periods noted.

---

[5] Rates were calculated from death reports and population estimates obtained as follows:
Deaths in the several age classes, recorded as due to acute poliomyelitis and polioencephalitis, were taken from the annual volumes of Mortality Statistics, 1910–33, U. S. Department of Commerce, Bureau of the Census. Figures for 1934, 1935, and 1936 were obtained from special tabulations kindly made available by the Bureau of the Census. Poliomyelitis deaths for the years 1937–40 were taken from Vital Statistics of the United States, Pt. I, Place of Occurrence, U. S. Department of Commerce, Bureau of the Census.

Populations in the several age groups as of July 1 each year were obtained by arithmetic interpolations of the 1910, 1920, 1930, and 1940 censuses. Rates were calculated separately for the under 1 year of age and the 1–4 year groups. Since the rates for the two classes were similar, and their trends almost identical, they were recalculated, as in table 2, for the 0–4 age group. Deaths in the 10–14 and 15–19 groups were not available separately for the entire period, and are therefore combined as 10–19.

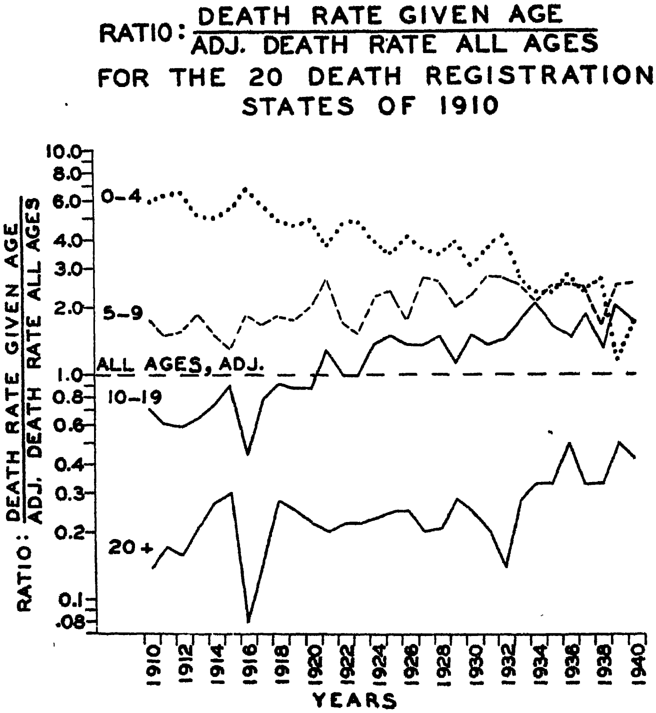


Figure 2.—Relative shift in age selection of fatal poliomyelitis, 1910–40

For children under 5 years of age the decline in mortality is striking and regular, except for the epidemic interruptions. For those persons 20 years of age and over, whatever evidence of trend as may be apparent is also in the direction of a decline in mortality. In the age groups 5–9 and 10–19, however, while the trend for the whole 31-year period is somewhat in the direction of a decline in mortality rates, the period 1920 to 1932 is marked by a tendency toward increase in mortality rates and after that there is a sharp decline.

Thus, for the whole period under study in the Death Registration States of 1910, the absolute trend of poliomyelitis mortality has been generally downward, with the reduction in rates most marked in persons under 5 years of age and least noticeable in those 20 years of age and over.

---

[6] Provisional crude death rates for these States for all ages, 1941–46, are as follows: 1941, 0.5; 1942, 0.3; 1943, 0.7; 1944, 1.2; 1945, 0.8; and 1946, 1.2.

In figure 2 are shown the trends of the ratios between age specifis death rates and adjusted total death rates, for consecutive yearc 1910–40, inclusive. These ratios portray not absolute trends but relative shifts each year between the several age groups. In effect they measure the same phenomenon as Das' percentage distributions of deaths except that ratios of rates are, in computation, adjusted for yearly changes in age distribution of population. It is apparent from figure 2 that there has been a relative decrease in deaths in persons under 5 and a compensatory increase in the other age groups. The relative increase throughout the whole period is perhaps most marked in persons 10–19 years of age, and least noticeable in those 5–9.

DISCUSSION

It is clear from these data that in the 20 Death Registration States of 1910, there has occurred between 1910 and 1940 a relative shift in age selection of deaths attributed to poliomyelitis. It is equally clear that there has been no absolute increase in mortality in any of the age groups considered. On the contrary, throughout the whole period there has been a general tendency toward decrease in mortality with, however, the decline hardly noticeable in those of 20 years of age and over.

Since the evidence thus far available for shift in age selection of reported cases has only demonstrated a similar relative shift, one is tempted to argue that no absolute shift in age selection of cases has occurred. This, however, does not necessarily follow. One cannot escape the impression that the ratio of infection to paralytic disease varies in different epidemics; and there is definitive evidence that the case fatality rate for all ages varies considerably under different situations even when based on paralytic cases only. In addition, case fatality rates may from time to time vary in different age classes. A variation such as this, for example, might explain the peculiar and pronounced relative shift in mortality noted in these data in 1916 and to some extent in 1932 (fig. 2).

In any event, real changes in case fatality conceivably could accompany real changes in age selection of cases, and produce the absolute changes in mortality rates observed in this experience. Therefore, though no evidence for an increased mortality in the higher age groups is here adduced, it does not necessarily follow that such a tendency has not occurred with regard to cases. Up to the present, however, only a relative increase in reported cases among older persons has been clearly demonstrated, and this is exactly what these data demonstrate for mortality.

CONCLUSIONS

1. For 20 Death Registration States of 1910 comprising about one-half the population of the United States, there has been a general downward trend, interrupted by eight epidemic excursions, in mortality attributed to poliomyelitis in the period 1910–40.

2. During this period there has been a relative increase in mortality among those 5 years of age and older.

3. This relative increase is not due to increased mortality rates in the older ages but, instead, to a more pronounced decline in mortality in those under 5 years of age.

4. The changes noted with regard to fatal poliomyelitis are not necessarily applicable to the nonfatal disease.

REFERENCES

(*1*) Forsbeck, F. C., and Luther, E. H.: New England J. Med. **203**: 1115 (1930).
(*2*) Feemster, R. F.: Personal communication.
(*3*) Limper, M. A., Thelander, H. E., and Shaw, E. B.: J. Prev. Med. **5**: 475 (1931).
(*4*) Knowlton, M.: Conn. Health Bull. **46**: 3 (1932).
(*5*) Das, A. N.: Quoted from reference (*17*) page 401. The work quoted is taken from a thesis entitled, "A study of the trend of age selection of poliomyelitis in the United States since 1910." Submitted to the Johns Hopkins University, School of Hygiene and Public Health. 1932. (Personal communication, Dr. K. F. Maxcy.)
(*6*) Wells, Mildred W.: N. Y. State J. Med. **32**: 393 (1932).
(*7*) Laidlaw, F. W.: J. A. M. A. **99**: 1053 (1932).
(*8*) Dunshee, J. D. and Stevens, I. M.: Am. J. Pub. Health **24**: 1197 (1934).
(*9*) Jenson, C.: Proc. Roy. Soc. Med. **28**: 1007 (1935).
(*10*) Burnet, F. M.: M. J. Australia **1**: 325 (1940).
(*11*) Helms, K., and Willcocks, W. J.: M. J. Australia **1**: 467 (1941).
(*12*) Horstmann, P.: Acta Med. Scandinav. **124**: 482 (1946).
(*13*) Lamoureux, E. E.: Conn. Health Bull. **61**: 225 (1947).
(*14*) Paul, J. R.: Infantile Paralysis. A symposium delivered at Vanderbilt University, April 1941, Baltimore, Waverly Press Inc., 1941, p. 137.
(*15*) Paul, J. R., Salinger, R., and Trask, J. D.: Am. J. Hyg. **17**: 601 (1933).
(*16*) Davis, D. J., Weber, F. J., Arey, M. S.: Pub. Health Rep. **56**: 1007 (1941).
(*17*) Poliomyelitis, International Committee for the Study of Poliomyelitis, Williams and Wilkins Company, Baltimore (1932).
(*18*) Dauer, C. C.: Pub. Health Rep., **58**: 937 (1943) Ibid. **60**: 633 (1945).
(*19*) Doull, J. A.: Am. J. Hyg. **8**: 633 (1928).
(*20*) Frost, W. H.: Hyg. Lab. Bull. No. 90, Government Printing Office, Washington (1913).
(*21*) Olin, G. and Heinertz, N.-O.: Zeitsch. f. Hyg. u. Infektionskr. **125**: 153 (1943).

STUDIES OF THE ACUTE DIARRHEAL DISEASES

XIX. Immunization in Shigellosis [1] [2]

By Albert V. Hardy,[3] Thelma DeCapito, *Assistant Bacteriologist, Public Health Service* and Seymour P. Halbert, *Assistant Surgeon (R), Public Health Service*

Immunization as a means of controlling communicable disease has been used in both military and civilian practice with increasing effectiveness. In regard to the value of *Shigella* vaccines, however, there are conflicting opinions (*1*, *2*, *3*, *4*, *5*) and there is no substantial evidence in the literature upon which to base a secure decision. Our investigation of this subject was begun July 1944. The evidence accumulated in the following 20 months strongly indicated that the present *Shigella* vaccines given parenterally are ineffective in the prevention of naturally occurring *Shigella* infections. Shaughnessy and his associates arrived at a similar conclusion through critical tests on human volunteers (*6*). Together, the two studies provide strong negative evidence. Our findings will be presented only with that detail necessary to prevent a repetition of unproductive exploration.

The mouse protection test was used extensively as the measure of antibody response (*7*, *8*). Pooled serums before and after inoculation were compared. The animals were given varying amounts of serums followed within 24 hours by a constant dosage of challenge organisms. The 50 percent protective volumes were computed by the method of Reed and Muench (*9*), as of the fourth day following infection. The "fold-increase" in protective antibodies was calculated by comparing the amounts of serums required to protect 50 percent of the mice before and after immunization. Agglutination tests were used as a supplementary measure of immune response.

The selection of the organisms to be used for vaccine production was left in the hands of the cooperating workers who provided the vaccine: Drs. A. J. Weil, Lederle Laboratories; H. J. Shaughnessy and S. Levinson, Chicago, and Captain Charles Seastone of the Army Medical School. Organisms of the highest antigenicity in mice were used. In the latter part of our study the vaccines were made from the same strains which were used by Shaughnessy and associates in their experiments (*6*).

The methods of processing the vaccines varied. We studied comparatively those prepared by killing the organisms by heat, formalin, and ultraviolet irradiation. There were no wide differences in antigenicity, though the ultraviolet-killed preparation (*10*) was ordinarily the most potent and the formalin-killed the least.

---

[1] From the Division of Infectious Diseases, National Institute of Health, with the cooperation of the Departments of Mental Hygiene of New York and Illinois and of the institutions in which the studies were conducted.

[2] The work reported in this paper was done under a transfer of funds recommended by the Committee on Medical Research, from the Office of Scientific Research and Development to the National Institute of Health.

[3] From the Bureau of Laboratories, Florida State Board of Health.

The factor of dosage seemed of particular importance in a six-organism polyvalent vaccine. Early we sought to determine the maximum amount which would be satisfactorily tolerated as the immunizing dosage. We observed that *Shigella* vaccines tend to produce a wide erythematous reaction with relatively little edema or soreness. Adults would tolerate a dosage of up to 2.5 billion organisms of a monovalent or polyvalent vaccine containing Flexner, Sonne, and Schmitz strains. The addition of Shiga organisms or modified Shiga toxin (as was done in the Army vaccine) resulted in disturbingly severe reactions, even when the total content was reduced to one billion organisms. The response to equal numbers of organisms killed by irradiation, heat, or formalin was closely similar, though the ultraviolet preparation was tolerated a little better than the others. Children and infants often had severe reactions even when given a much reduced dosage. The amounts finally employed for adults was 6.25 billion organisms in three doses (1.25, 2.5, and 2.5, respectively) given at weekly intervals, for all vaccines except those containing the modified Shiga toxin. With the Army vaccine the total dosage (administered in three equal doses) was 1.5 billion organisms (Flexner and Sonne) and 0.024 mg. of Shiga antigen. Children and infants were given one-half to one-fourth of the adult doses, depending on age and weight.

The significance of booster inoculation and/or revaccination 6 to 8 months after the initial treatments was studied. There was no suggestion that the second inoculations have better responses than those which followed the first series.

The practical significance of adjuvants was examined. Using the technic of Freund and his group (*11*), we compared the response of rabbits to equal doses of vaccine given in saline, and in falba and mineral oil. In agreement with other investigators (*12*), the antibody titers remained high for prolonged periods with the adjuvants; without them the titers rapidly returned to low levels. However, our patients could tolerate only small doses of *Shigella* vaccine when given in oil emulsion. Three subcutaneous abscesses resulted from our initial small series of inoculations. We elected, therefore, to test the efficacy of large doses of vaccine given in saline.

These early observations served as a basis for our trials of these vaccines in groups with a high endemic incidence of *Shigella* infections. For these, we turned to institutions for the mentally ill or defective. We had the cooperation of the Departments of Mental Hygiene in both New York and Illinois. We selected five institutions in which *Shigella* infections had been a recurring problem over a period of years. The infection occurred during the period of study in two of the five institutions. In obtaining our test and control groups in these, the inmates of a ward or building were listed alphabetically. Alternate patients were used in one; in the other the alphabetic list was divided in thirds and those in the mid-third were retained as the controls.

The infection in the New York institution was due to Flexner Z. It spread to the four buildings where patients had been inoculated. Those concerned were low-grade mentally defective inmates 5 years of age and older. The adult dosage of Army vaccine as stated was given. A total of 6.25 billion organisms of the polyvalent irradiated vaccine was used. Monovalent Flexner Z vaccine was also tested, but in a total of only 3.75 billion organisms given in three equally divided doses. The infection had been introduced to one group just before the inoculations were started, and one group remained free of infection for 2 months following the injections. However, the spread of infection in all was at that time when protection should have been provided if immunization had practical value. The groups under observation were examined culturally at weekly intervals. Cases of diarrhea were reported by the attendants in charge, and these were cultured promptly. Inoculations were given in March and April; the groups were followed up to the end of July. The findings are summarized in table 1. There was no evidence that the vaccines had any significant beneficial effect. Even the severity of the clinical infections did not vary appreciably insofar as we could determine.

TABLE 1.—Shigella *infections discovered following the completion of inoculation with* Shigella *vaccines in a New York State institution for the mentally defective*

Group	Controls			Inoculated			
	Individuals	Positive clinical cases	Total known infected	Individuals	Positive clinical cases	Total known infected	Vaccine used
A	65	14	46	64	18	44	U. V.[1] polyvalent.
B	62	9	39	62	7	41	U. V.[1] monovalent.
C	69	9	45	69	5	46	Army.
D	69	16	44	68	15	41	Do.
Total	265	48	174	263	45	172	

[1] Killed by ultraviolet irradiation.

The studies in the Illinois institutions were continued through a period of 15 months. During this time four *Shigella* infections (Flexner V and W, Sonne and Schmitz) spread actively. Booster doses were used 6 months after the initial inoculations, and revaccination 2 months later. The findings without reference to the particular vaccine used are summarized in table 2. In all, 53 percent of the controls and 51 percent of those vaccinated became infected.

One uncontrolled group was also studied. *Shigella* infections were quite troublesome among the 123 inmates of the nursery. All of these were inoculated with the hope of obtaining a maximum effect within the group. Children injected in November 1944 were reinoc-

TABLE 2.—Shigella *infections discovered following inoculation with* Shigella *vaccines in an Illinois institution for the mentally defective*

Group	Controls							Inoculated						
	Individuals	Total known infected	Total known infections					Individuals	Total known infected	Total known infections				
			Fv [1]	Fw [2]	So [3]	Sch [4]	Total			Fv [1]	Fw [2]	So [3]	Sch [4]	Total
A	44	27	16	0	8	19	43	44	21	14	0	5	11	39
								43	16	7	0	4	8	19
B	44	23	11	5	5	8	29	43	19	11	8	5	6	30
								37	23	12	3	6	8	29
C	46	21	12	0	5	11	28	46	28	21	1	4	10	36
								46	26	15	0	9	13	37
Total	134	71	39	5	18	38	100	259	133	80	12	33	56	181

[1] *Shigella paradysenteriae* (Flexner V).
[2] *Shigella paradysenteriae* (Flexner W).
[3] *Shigella sonnei.*
[4] *Shigella schmitzii.*

ulated in May 1945. The recent admissions had the one series of injections only. During the summer, 64 (52 percent) of the 123 children became infected with *Shigella*, with a total of 87 known separate infections. Acute diarrhea was prevalent. Considering this high incidence of infection, in addition to the fact that several of the children were quite ill as a result of the inoculations, it was generally felt that *Shigella* vaccines, as now available, have no practical value in the prevention of disease, or infection, in such a group of young children.

The evidence in our opinion warrants the broader conclusion that present vaccines administered parenterally have no significant value in the control of clinical or subclinical *Shigella* infections.

REFERENCES

(*1*) Felsen, J.: Bacillary dysentery, colitis, and enteritis. Philadelphia, W. B. Saunders Co. (1945).
(*2*) Caldwell, W. A., and Hardwick, S. W.: Observations on Flexner dysentery. Edinburg Med. J. **50:** 129 (1943).
(*3*) Dudgeon, L. S., et al.: Study of bacillary dysentery occurring in the British forces in Macedonia. Med. Res. Comm. Spec. Rep. Ser., No. 40 (1919).
(*4*) Vincent, H.: Vaccination against bacillary dysentery with ethero-vaccine. J. of State Med. **29:** 54 (1921).
(*5*) Weil, A. J.: Dysentery, a progress report for the years 1942 to 1946. J. Immunol. **55:** 363 (1947).
(*6*) Shaughnessy, H. J., Olsson, R. C., Bass, K., Friewer, F., and Levinson, S. O. Experimental human bacillary dysentery. J. A. M. A. **132:** 362 (1946).
(*7*) Thibault, P., and Rist, N.: Sérothérapie de l'infection expérimentale a bacilles dysentériques du type Flexner chez la souris. Compt. rend. Soc. Biol. **133:** 605 (1940).
(*8*) Smolens, J., Halbert, S. P., Mudd, S., Doak, B. W., and Gonzalez, L. M.: Studies with the somatic antigen of Shigella paradysenteriae (Flexner). J. Immunol. **52:** 41 (1946).
(*9*) Reed, L. J., and Muench, H.: A simple method of estimating 50 percent endpoints. Am. J. Hyg. **27:** 493 (1938).
(*10*) Shaughnessy, H. J., Milzer, A., Neal, J., and Levinson, S. O.: Production of potent inactivated vaccines with ultraviolet irradiation. IV. Vaccination against bacillary dysentery. J. Infect. Dis. **78:** 69 (1946).
(*11*) Freund, J., and Bonanto, M. V.: The effect of paraffin oil, lanolin-like substances and killed tubercle bacilli on immunizations with diphtheric toxoid and *Bacterium typhosum.* J. Immunol. **48:** 325 (1944).
(*12*) Halbert, S. P., Mudd, S., and Smolens, J.: The increased antigenicity of Shigella paradysenteriae (Flexner) in saline-in-mineral-oil emulsion. J. Immunol. **53:** 291 (1946).

SICKNESS ABSENTEEISM AMONG INDUSTRIAL WORKERS, THIRD AND FOURTH QUARTERS OF 1947[1]

TREND OF DISABLING MORBIDITY, 1938–47

By W. M. GAFAFER, *Principal Statistician, Public Health Service, Federal Security Agency*

Accompanying data on sickness absenteeism are derived from periodic reports of 8-day or longer disabilities submitted by a group of industrial sick benefit organizations representing approximately 200,000 male workers. Table 1 gives the average annual number of absences per 1,000 males by cause for various periods of 1947 together with comparable data for earlier years. Figure 1 presents for all causes and each of four broad cause groups a 4-quarter moving average of frequencies (annual basis) for the 40 quarters of the 10 years, 1938–47.

THIRD QUARTER, 1947

A comparison of third-quarter rates for 1947 and 1946 shown in table 1 reveals a number of lower rates in 1947, decreases of over 20 percent in frequency being recorded for neurasthenia, "other diseases of nervous system," the rheumatic group of diseases,[2] and each specific respiratory cause except pneumonia. Digestive diseases exhibit relatively stable rates in the two third-quarter periods, appendicitis constituting a notable exception with a frequency increase in 1947 of almost 40 percent.

FOURTH QUARTER, 1947

Generally lower frequencies continued in the fourth quarter of 1947, the rate for each specific digestive and nonrespiratory-nondigestive cause being less than the corresponding rate for 1946. With the exception of influenza and grippe, yielding a frequency increase in 1947 of 15 percent, respiratory disease rates in the two fourth-quarter periods show relatively little change.

DISABLING MORBIDITY TREND, 1938–47

Figure 1 permits an investigation of the trend of disabling morbidity over the 10 years, 1938–47, as revealed by a 4-quarter moving average of the annual number of absences per 1,000 males recorded for the 40 quarters of the 10-year period. Seasonal variation and minor fluctuations in the rates are eliminated by the smoothing properties of the moving average.

---

[1] From Industrial Hygiene Division, Bureau of State Services. Report for first and second quarters of 1947 appeared in PUBLIC HEALTH REPORTS, 62: 1773–1774 (December 19, 1947).

[2] Rheumatism, acute and chronic; neuralgia, neuritis, sciatica; and diseases of organs of movement except diseases of joints.

TABLE 1.—*Number of absences per 1,000 males (annual basis) on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by cause; experience of male employees in various industries, third and fourth quarters of 1947* [1]

Cause[2]	Number of absences per 1,000 males (annual basis) beginning in specified period									
	Third quarter		First 9 months			Fourth quarter		Year		
	1947	1946	1947	1946	1942–46	1947	1946	1947	1946	1942–46
Sickness and nonindustrial injuries	88.7	97.0	110.1	116.9	127.5	96.2	107.2	106.6	114.5	129.2
Nonindustrial injuries (169–195)	13.1	12.8	11.9	12.4	12.3	10.3	11.9	11.5	12.3	12.2
Sickness	75.6	84.2	98.2	104.5	115.2	85.9	95.3	95.1	102.2	117.0
Respiratory diseases	18.5	23.4	37.6	40.0	50.2	34.3	32.9	36.7	38.2	52.5
Tuberculosis of respiratory system (13)	.5	.7	.6	.7	.8	.5	.5	.6	.7	.7
Influenza, grippe (33)	4.4	5.9	16.1	16.0	19.5	11.2	9.7	14.8	14.4	21.3
Bronchitis, acute and chronic (106)	3.1	4.1	5.3	5.7	8.2	6.3	5.9	5.6	5.7	8.7
Pneumonia, all forms (107–109)	2.3	2.0	3.7	3.8	6.3	3.6	3.3	3.7	3.7	6.2
Diseases of pharynx and tonsils (115b, 115c)	2.9	3.7	3.9	4.5	5.9	3.7	4.1	3.8	4.4	5.6
Other respiratory diseases (104, 105, 110–114)	5.3	7.0	8.0	9.3	9.5	9.0	9.4	8.2	9.3	10.0
Digestive diseases	16.8	15.6	16.9	16.4	18.0	14.0	17.1	16.2	16.6	17.8
Diseases of stomach except cancer (117, 118)	4.7	5.0	5.1	4.9	5.9	4.8	5.4	5.1	5.0	5.9
Diarrhea and enteritis (120)	2.4	2.2	2.4	2.0	2.3	1.6	2.4	2.2	2.1	2.2
Appendicitis (121)	3.9	2.8	3.7	3.2	4.4	3.1	3.7	3.5	3.4	4.3
Hernia (122a)	2.4	2.3	2.3	2.9	2.2	1.6	2.2	2.1	2.7	2.2
Other digestive diseases (115a, 115d, 116, 122b–129)	3.4	3.3	3.4	3.4	3.2	2.9	3.4	3.3	3.4	3.2
Nonrespiratory-nondigestive diseases	36.9	41.4	39.8	44.4	42.7	34.3	42.4	38.4	43.9	42.3
Infectious and parasitic diseases (1–12, 14–24, 26–29, 31, 32, 34–44)[3]	2.9	2.4	2.7	3.2	2.9	1.6	2.8	2.5	3.1	2.7
Rheumatism, acute and chronic (58, 59)	3.2	4.3	3.7	4.9	5.3	3.7	4.2	3.7	4.7	5.1
Neurasthenia and the like (part of 84d)	1.5	2.2	1.8	2.1	1.9	1.2	2.1	1.6	2.1	1.9
Neuralgia, neuritis, sciatica (87b)	2.3	3.1	2.5	3.0	3.0	2.1	2.8	2.4	3.0	3.0
Other diseases of nervous system (80–85, 87, except part of 84d, and 87b)	1.6	2.3	1.6	2.1	1.8	1.4	1.7	1.5	2.0	1.8
Diseases of heart and arteries, and nephritis (90–99, 102, 130–132)	5.9	5.6	7.0	7.2	6.4	5.5	6.7	6.6	7.1	6.5
Other diseases of genitourinary system (133–138)	2.9	3.2	3.0	3.1	3.1	3.0	3.3	3.0	3.2	3.1
Diseases of skin (151–153)	3.8	4.2	3.4	3.7	3.4	3.7	3.8	3.5	3.7	3.4
Diseases of organs of movement except diseases of joints (156b)	2.5	3.3	3.0	3.4	3.5	2.7	3.5	2.9	3.4	3.5
All other diseases (45–57, 60–79, 88, 89, 100, 101, 103, 154, 155, 156a, 157, 162)	10.3	10.8	11.1	11.7	11.4	9.4	11.5	10.7	11.6	11.3
Ill-defined and unknown causes (200)	3.4	3.8	3.9	3.7	4.3	3.3	2.9	3.8	3.5	4.4
Average number of males	194,970	198,432	193,991	197,258	1,191,874	195,660	193,748	194,408	196,381	1,184,088

---

[1] Industrial injuries and venereal diseases are not included.

[2] Numbers in parentheses are diseases title numbers from "International List of Causes of Death, 1939."

[3] Exclusive of influenza and grippe, respiratory tuberculosis, and venereal diseases.

For all causes and each broad cause group the initial plotted point represents the arithmetic mean of rates for the four quarters of 1938, the average being centered at July 1, the midpoint of the 4-quarter period. The second plotted point is the arithmetic mean of rates for the second, third, and fourth quarters of 1938, and the first quarter of 1939, and is centered at the midpoint of this period, October 1, 1938. The final plotted point represents the mean of rates for the four quarters of 1947, and is centered at July 1, 1947.

An unusually low or high rate recorded for a particular quarter when compared with the same quarter of the preceding or succeeding year, affects the four successive mean values to which that quarter contributes. Thus it will be observed in figure 1 that locally low averages yielded for respiratory diseases in the four successive periods centered at October 1, 1941, January 1, April 1, and July 1, 1942, reflect the nonepidemic character of the respiratory disease rate recorded for the first quarter of 1942 (57.6 absences per 1,000 males) when compared with the corresponding quarter of 1941 (79.7) and 1943 (97.7).

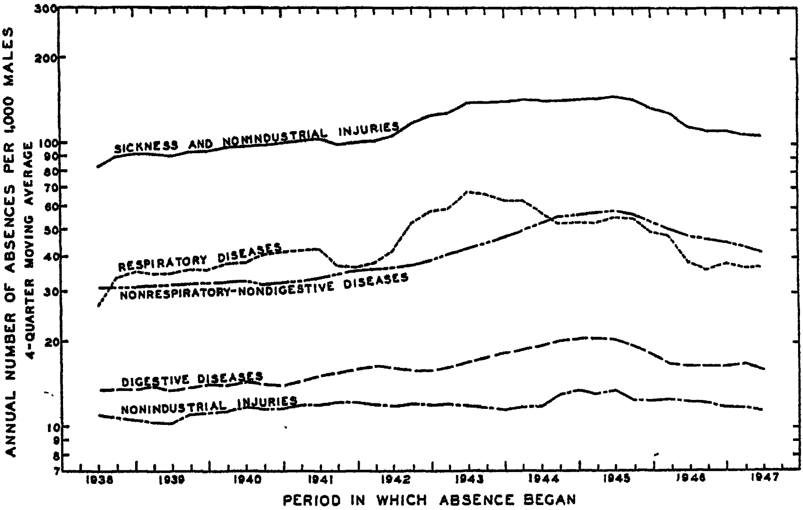


FIGURE 1.—*Annual number of absences per 1,000 males (4-quarter moving average) on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by broad cause group; experience of male employees in various industries, 1938–47, inclusive. (Logarithmic vertical scale.)* Note: *Each average rate is plotted against the mark on the horizontal axis which is the midpoint of the 4-quarter period giving rise to the average. Nonrespiratory-nondigestive diseases include ill-defined and unknown causes.*

Figure 1 reveals the following relationships:

1. Moving averages for all causes tend to increase during the period 1938–43, remaining at a relatively high level during 1943–45 (approximately 25 percent above the 40-quarter mean of 112.5 absences per 1,000 males), and decreasing during 1946 and 1947.
2. Average rates for digestive and nonrespiratory-nondigestive diseases tend to move in a parallel fashion, although at different levels, over the 10-year period. For each of the two cause groups the rates

are remarkably stable during 1938–40, revealing an increasing trend during 1941–45, and tending to decrease in 1946 amd 1947.

3. For the group of respiratory diseases, on the other hand, the average rates exhibit an increasing trend during 1938-43, a peak value being determined by the four quarters of 1943 (66.8 absences per 1,000 males) which is over 50 percent above the 40-quarter mean for respiratory diseases (43.9). Subsequent averages tend to decrease.

4. With the exception of the initial value, the average rates for respiratory diseases consistently exceed corresponding averages for nonrespiratory-nondigestive diseases during 1938–44; this relationship is reversed during 1944–47.

Observed excesses in disability frequency during the war period are particularly notable when it is recalled that the present experience is based on absences of 8 days or longer generally certified by a physician. In any interpretation of the data consideration must be given to the possible effects on recorded sick absenteeism of changes in composition of exposed populations with respect to age, physical fitness, and general work experience, as well as the possible influence of other factors such as night work and overtime.

THE DISTRIBUTION OF ENDEMIC TYPHUS IN RATS IN LAVACA COUNTY, TEXAS[1]

By J. V. Irons,[2] J. N. Murphy, Jr.[2] and David E. Davis, *S. A. Sanitarian (R), Public Health Service*

In connection with an investigation of typhus control procedures in Lavaca County, Texas, rats were trapped in nearly every area of the county for blood test by the complement-fixation technic.[3] The procedure utilized was a slight modification of that described by Brigham and Bengston (*1*). We were particularly interested in surveying rural areas in order to learn more regarding the distribution of murine typhus on the farms. Rats were caught in No. 0 steel traps and brought alive in sacks to the Hallettsville field laboratory where they were bled, examined for ectoparasites, measured, and sex determined. All data were recorded on punch cards.

---

[1] From the Communicable Disease Center, Public Health Service, Atlanta, Georgia and the Texas State Health Department, Austin, Texas.

[2] Staff members of Laboratories of the Texas State Health Department.

[3] The antigen utilized was a suspension of endemic typhus rickettsiae kindly supplied by Dr. H. R. Cox, Pearl River, New York.

The principal criterion employed in selection of trapping sites in this survey was that there be *recent evidence of abundance of rats*. An establishment was considered "negative" if no rat had a positive complement-fixation test and if at least three adult rats had negative tests. An establishment was considered "positive" if one or more rats had a positive test. The findings in this report are based on rats trapped from January through December 1945, with the exception that trapping was discontinued in Yoakum in April. *Rattus rattus* was found throughout the county, but *Rattus norvegicus* was found only in Yoakum. The characteristics of the rats have been described by Davis (*2*).

Blood samples from rats of all ages were obtained. The serum titers varied at least from 1–10 to 1–1280. Adult rats tended to give higher percentages of positive tests than young or subadult rats (table 1).

TABLE 1.—*Results of complement-fixation tests, by age groups and species of rats*

	Rattus rattus		Rattus norvegicus	
	Number of rats	Percentage positive	Number of rats	Percentage positive
Adults:				
Urban	307	71	22	77.3
Rural	367	47.7	0	----------
Total	674	58.3	22	77.3
Young and subadults:				
Urban	165	43	14	57.1
Rural	161	37.8	0	----------
Total	326	40.4	14	57.1
Grand total	1,000	52.5	36	69.4

It is evident (table 2) that rats showing positive tests were found on the majority of farms and semirural establishments which were sampled.

TABLE 2.—*Results of complement-fixation tests on* Rattus rattus

Urban				Rural			
Number of places sampled	Percentage positive	Number of rats tested	Percentage positive	Number of places sampled	Percentage positive	Number of rats tested	Percentage positive
70	94	472	61.2	203	77	528	44.7

That the great majority of farms had been or were foci of murine typhus was not too surprising, since many cases of typhus have been recognized in farm families of Lavaca County in recent years. Many farms were inadequately sampled so that the county-wide survey was far from complete. These findings are somewhat similar to those from Coffee County, Alabama (*3*).

Unfortunately, this report permits no conclusions regarding when the rats in question acquired infection or whether the foci of infection were active or dormant. A subsequent report (*4*) on the distribution of infected fleas in Lavaca County may provide some information on this problem. It seems probable at any rate that a considerable number of the farms in Lavaca County should be included in typhus control activities.

SUMMARY

Based on results of complement-fixation tests for endemic typhus of rats in Lavaca County, Texas:

1. Ninety-four percent of 70 urban establishments sampled harbored rats with positive tests. Of 472 *Rattus rattus* from urban establishments, 61 percent gave positive tests, and of 36 *Rattus norvegicus*, 69 percent gave positive tests.
2. In rural or semirural areas 77 percent of 203 farms or semirural establishments harbored rats with positive tests, and 44 percent of 528 rats gave positive tests.
3. The widespread distribution of typhus in rats on farms suggests that such areas must be included in control activities.

REFERENCES

(1) Brigham, G. D. and Bengston, I. A.: A Study of the complement-fixation and Weil-Felix reactions in wild rats as related to the isolation of the virus of endemic typhus. Pub. Health Rep. **60**: 29–46 (1945).

(*2*) Davis, D. E.: Notes on commensal rats in Lavaca County, Texas. Jour. Mamm. **28**: 241–244 (1947).

(*3*) Hill, E. L. and Ingraham II, S. C.: A study of murine typhus fever in Coffee County, Alabama. Pub. Health Rep. **62**: 875–881 (1947).

(*4*) Irons, J. V., Randolph, N. M., and Beck, Oleta: Distribution of fleas carrying typhus rickettsiae in Lavaca County, Texas. Unpublished data.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED MAY 1, 1948

Summary

Of 56 cases of poliomyelitis reported for the week (last week 39), Texas reported 25 (last week 10), North Carolina 7, Iowa 5, and New Jersey, Florida, and California, 3 each. No other State reported more than 1 case. The 5-year (1943–47) median is 28, reported for the corresponding week last year. The largest corresponding number of the past 5 years was 47, reported for the week in 1946, and the least 18, in 1944. For the 6-week period since March 20, the approximate average date of seasonal low incidence, 214 cases have been reported, as compared with 170 for the same period last year, 184 in 1946, the highest in the past 6 years, and 92, the lowest, in 1942.

The incidence of measles increased from a total of 27,438 cases last week to 28,426 for the current week, as compared with a 5-year median of 26,526. The total since the first of the year is 306,597, as compared with a 5-year median of 314,834. The largest number reported for the corresponding periods of the past 5 years was 428,804, in 1944, and the smallest, 49,965, in 1945.

For the current week, Wyoming reported 2 cases of Rocky Mountain spotted fever, and Missouri, Kansas, and Mississippi 1 case each of smallpox.

Since the first of the year, cumulative figures slightly above the corresponding median expectancies have been reported for the dysenteries (amebic, bacilliary, and undefined, combined), infectious encephalitis (approximately the same as the median), tularemia, and undulant fever. For the current week figures above the medians are reported for the dysenteries, measles, poliomyelitis, and tularemia.

Deaths recorded during the week in 93 large cities of the United States totaled 9,041, as compared with 9,210 last week, 8,977 and 8,974, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 8,974. The total for the 18-week period ended May 1 is 179,575, as compared with 179,924 for the corresponding period last year. Infant deaths for the week in the same cities totaled 679, as compared with 659 last week and a 3-year median of 645. The cumulative figure is 12,417, as compared with 14,295 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended May 1, 1948, and comparison with corresponding week of 1947 and 5-year median.

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	May 1, 1948	Apr. 26, 1947		May 1, 1948	Apr. 26, 1947		May 1, 1948	Apr. 26, 1947		May 1, 1948	Apr. 26, 1947	
NEW ENGLAND												
Maine	0	0	0	2	1	1	11	229	170	0	2	2
New Hampshire	0	0	0	-------	21	1	19	7	35	0	1	1
Vermont	0	0	0	-------	4	-------	9	280	109	0	0	0
Massachusetts	4	13	4	-------	-------	-------	1,503	332	1,017	0	5	6
Rhode Island	0	1	1	2	1	-------	4	294	10	0	0	1
Connecticut	2	0	0	5	12	1	92	932	481	0	0	2
MIDDLE ATLANTIC												
New York	9	15	15	[1]1	[1]5	[1]3	2,910	629	1,836	2	11	19
New Jersey	1	0	4	1	10	8	1,387	404	1,505	1	3	6
Pennsylvania	16	23	16	(2)	(2)	[2]2	2,060	250	956	7	1	13
EAST NORTH CENTRAL												
Ohio	9	6	6	1	14	14	1,112	657	657	2	7	9
Indiana	9	9	6	-------	6	3	597	119	198	2	2	5
Illinois	1	4	6	20	39	7	1,418	148	918	4	8	11
Michigan [3]	0	9	8	-------	4	1	1,483	128	1,078	5	9	9
Wisconsin	2	0	1	44	99	54	2,045	343	1,703	1	2	3
WEST NORTH CENTRAL												
Minnesota	3	6	4	-------	-------	-------	555	258	258	3	2	2
Iowa	1	1	2	-------	696	-------	289	225	225	1	2	2
Missouri	2	2	1	7	6	3	440	22	212	2	2	7
North Dakota	0	1	1	-------	4	1	17	16	16	0	0	0
South Dakota	0	0	1	-------	-------	-------	86	57	30	2	0	0
Nebraska	0	1	1	4	5	3	421	6	255	0	0	1
Kansas	3	8	3	-------	2	2	92	9	402	0	2	4
SOUTH ATLANTIC												
Delaware	0	0	0	-------	2	-------	65	2	15	0	0	0
Maryland [3]	1	12	14	1	16	4	406	35	327	0	1	4
District of Columbia	0	0	0	-------	-------	-------	115	32	132	1	3	3
Virginia	7	1	2	186	2,885	142	343	464	464	0	1	7
West Virginia	5	1	2	12	33	9	316	40	132	0	3	3
North Carolina	9	8	6	-------	-------	-------	19	116	321	0	2	4
South Carolina	5	5	5	319	914	267	103	216	216	0	0	2
Georgia	2	4	3	25	94	8	69	111	111	0	0	1
Florida	2	1	5	4	13	13	306	124	124	0	0	2
EAST SOUTH CENTRAL												
Kentucky	3	7	4	1	13	3	194	53	135	2	1	5
Tennessee	3	3	3	60	178	29	396	120	227	3	4	6
Alabama	6	2	7	33	445	45	88	305	143	0	4	8
Mississippi [3]	4	3	5	2	49	-------	46	15	-------	5	0	3
WEST SOUTH CENTRAL												
Arkansas	1	1	3	45	194	44	158	53	149	1	1	2
Louisiana	4	6	5	2	8	8	12	79	79	0	2	2
Oklahoma	3	2	3	21	347	32	73	4	42	2	0	1
Texas	22	16	29	540	1,459	711	2,629	393	739	3	4	15
MOUNTAIN												
Montana	1	2	1	-------	78	15	14	96	96	0	1	1
Idaho	1	3	0	12	22	2	66	5	52	0	0	1
Wyoming	0	0	0	-------	-------	-------	138	21	43	1	0	0
Colorado	0	5	6	18	28	22	564	69	246	0	0	2
New Mexico	1	1	2	3	3	6	139	62	51	0	0	0
Arizona	0	3	3	32	193	85	556	122	122	1	0	0
Utah [3]	6	0	0	5	54	5	301	11	154	0	0	0
Nevada	0	0	0	-------	-------	-------	1	-------	2	0	0	0
PACIFIC												
Washington	3	2	2	3	15	-------	858	46	256	3	1	3
Oregon	4	1	2	16	40	20	147	25	163	1	0	1
California	9	13	22	6	25	25	3,854	219	1,360	4	5	16
Total	164	201	211	1,433	8,037	1,734	28,426	8,183	26,526	59	92	202
17 weeks	3,323	4,633	4,633	129,178	286,790	181,831	306,597	98,993	314,834	1,386	1,517	4,009
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	9,681	12,199	13,337	172,736	319,765	319,765	341,543	121,880	352,847	2,168	2,489	6,461

[1] New York City only.
[2] Philadelphia only.
[3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended May 1, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [4]		
	Week ended—		Median 1943–47	Week ended		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	May 1, 1948	Apr. 26, 1947		May 1, 1948	Apr. 26, 1947		May 1, 1948	Apr. 26, 1947		May 1, 1948 [5]	Apr. 26, 1947	
NEW ENGLAND												
Maine	0	0	0	9	10	36	0	0	0	2	0	0
New Hampshire	0	0	0	3	8	8	0	0	0	0	0	0
Vermont	0	0	0	1	3	6	0	0	0	0	0	0
Massachusetts	0	0	0	185	106	315	0	0	0	2	4	4
Rhode Island	0	0	0	6	8	12	0	0	0	1	0	0
Connecticut	0	0	0	36	56	83	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	1	2	3	[6] 224	317	580	0	0	0	2	2	3
New Jersey	3	0	0	78	111	170	0	0	0	1	0	0
Pennsylvania	1	0	0	371	188	364	0	0	0	1	4	4
EAST NORTH CENTRAL												
Ohio	0	1	0	280	235	397	0	0	0	5	3	3
Indiana	0	0	0	15	104	104	0	0	1	1	5	2
Illinois	0	0	1	92	98	239	0	0	0	2	2	0
Michigan [3]	1	1	0	111	111	157	0	0	0	0	1	1
Wisconsin	0	0	0	70	77	178	0	0	0	0	1	1
WEST NORTH CENTRAL												
Minnesota	0	0	0	28	33	55	0	0	0	0	0	0
Iowa	5	0	0	20	34	45	0	0	0	0	1	0
Missouri	1	1	0	[6] 26	23	48	1	3	0	0	1	1
North Dakota	0	0	0	4	5	11	0	2	0	1	0	0
South Dakota	1	0	0	[6] 8	6	8	0	0	0	0	0	0
Nebraska	1	0	0	16	9	32	0	0	0	0	0	0
Kansas	0	0	0	29	38	53	1	1	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	7	7	7	0	0	0	0	0	0
Maryland [3]	0	0	0	[6] 30	36	146	0	0	0	0	0	2
District of Columbia	0	0	0	9	9	23	0	0	0	1	0	0
Virginia	1	0	0	16	7	64	0	0	0	2	1	1
West Virginia	0	0	0	[6] 17	15	28	0	0	0	0	0	1
North Carolina	7	0	0	14	26	37	0	0	0	0	1	2
South Carolina	0	3	0	3	5	8	0	1	0	0	1	1
Georgia	[7] 1	0	0	9	8	12	0	0	0	6	3	3
Florida	3	5	4	0	9	9	0	0	0	3	2	2
EAST SOUTH CENTRAL												
Kentucky	0	0	0	14	29	49	0	1	0	2	2	1
Tennessee	0	0	0	26	32	32	0	0	0	0	0	2
Alabama	0	1	0	2	7	19	0	0	0	2	1	1
Mississippi [3]	1	0	0	4	8	7	1	0	0	2	0	1
WEST SOUTH CENTRAL												
Arkansas	0	0	0	2	4	11	0	0	0	2	2	2
Louisiana	0	2	1	1	6	10	0	0	1	6	3	3
Oklahoma	0	0	0	9	9	12	0	1	0	0	2	2
Texas	25	1	4	20	35	62	0	0	0	3	5	8
MOUNTAIN												
Montana	0	0	0	11	5	10	0	0	0	0	0	0
Idaho	0	0	0	[6] 13	1	37	0	1	0	1	0	0
Wyoming	0	0	0	0	1	13	0	0	0	0	0	0
Colorado	1	0	0	14	35	44	0	0	0	0	1	1
New Mexico	0	0	0	4	7	10	0	4	0	0	0	0
Arizona	0	0	0	4	10	11	0	0	0	0	1	0
Utah [3]	0	0	0	15	20	23	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	0	0	1	53	32	44	0	0	0	0	1	1
Oregon	0	0	0	15	23	28	0	0	0	0	2	0
California	3	11	7	86	114	170	0	0	0	4	5	5
Total	56	28	28	2,010	2,080	4,104	3	14	9	52	57	77
17 weeks	[7] 562	782	580	39,030	44,960	67,902	43	102	175	799	738	979
Seasonal low week [4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	[7] 214	170	170	61,569	71,646	106,223	64	156	258	326	253	371

---

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever reported separately, as follows: Maine 1, Massachusetts (salomonella infection) 1, Rhode Island 1, Virginia 1, California 1.

[6] Including cases reported as streptococcal sore throat.

[7] Correction (deducted from cumulative totals): Poliomyelitis, Georgia, week ended April 17, 1 case (instead of 2).

Telegraphic marbidity reports from State health officers for the week ended May 1, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended May 1, 1948							
	Week ended—		Median 1943-47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	May 1, 1948	Apr. 26, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	18	23	25	------	------	------	------	------	------	------	1
New Hampshire	------	------	------	------	------	------	------	------	------	------	1
Vermont	18	4	23	------	------	------	------	------	------	------	2
Massachusetts	27	111	122	------	3	------	------	------	------	------	1
Rhode Island	15	14	14	------	------	------	------	------	------	------	1
Connecticut	7	26	46	------	------	------	------	------	------	------	3
MIDDLE ATLANTIC											
New York	99	156	156	5	9	------	2	------	------	------	9
New Jersey	49	174	165	------	------	------	------	------	------	------	3
Pennsylvania	67	201	201	------	------	------	------	------	------	------	2
EAST NORTH CENTRAL											
Ohio	58	176	176	------	------	------	------	------	------	------	3
Indiana	3	71	40	------	------	------	------	------	------	------	2
Illinois	23	69	69	12	2	------	2	------	------	------	8
Michigan [3]	50	162	90	1	------	------	1	------	------	------	6
Wisconsin	58	193	104	------	------	------	------	------	------	------	------
WEST NORTH CENTRAL											
Minnesota	20	14	18	------	------	------	------	------	------	------	8
Iowa	15	17	20	------	------	------	------	------	------	------	2
Missouri	29	21	19	------	------	1	------	------	1	------	1
North Dakota	2	------	1	4	------	------	------	------	------	------	------
South Dakota	6	------	2	------	------	------	------	------	------	------	2
Nebraska	4	20	18	------	1	------	2	------	------	------	2
Kansas	68	31	31	------	------	------	------	------	1	------	1
SOUTH ATLANTIC											
Delaware	6	4	1	------	------	------	------	------	------	------	------
Maryland [3]	13	72	65	------	------	------	------	------	------	------	------
District of Columbia	11	11	7	------	------	------	------	------	------	------	------
Virginia	38	124	62	------	------	58	------	------	------	------	2
West Virginia	14	32	29	------	------	------	------	------	------	------	1
North Carolina	54	77	159	------	1	------	------	------	2	------	------
South Carolina	82	96	73	1	6	------	------	------	------	1	------
Georgia	22	11	12	------	1	------	------	------	2	2	6
Florida	34	63	16	4	2	3	------	------	3	4	1
EAST SOUTH CENTRAL											
Kentucky	13	11	22	------	------	------	------	------	------	------	------
Tennessee	38	23	26	2	------	------	------	------	------	------	------
Alabama	32	120	22	------	------	------	------	------	3	4	2
Mississippi [3]	3	14	------	------	------	------	------	------	------	1	1
WEST SOUTH CENTRAL											
Arkansas	30	59	39	3	2	------	------	------	1	------	1
Louisiana	3	13	7	6	------	------	------	------	------	------	1
Oklahoma	20	6	6	6	------	1	------	------	2	------	2
Texas	499	644	391	25	373	32	------	------	1	1	12
MOUNTAIN											
Montana	5	7	5	------	------	------	------	------	------	------	1
Idaho	4	9	8	------	------	------	------	------	------	------	------
Wyoming	------	------	------	------	------	------	------	2	------	------	------
Colorado	32	14	25	------	------	------	------	------	------	------	5
New Mexico	46	19	17	------	------	------	------	------	------	------	------
Arizona	27	56	19	------	------	35	------	------	------	------	------
Utah [3]	17	13	33	------	------	------	------	------	------	------	1
Nevada	------	------	------	------	------	------	------	------	------	------	------
PACIFIC											
Washington	65	29	33	------	------	------	------	------	1	------	------
Oregon	24	13	14	7	------	------	------	------	------	------	1
California	112	299	299	10	16	------	------	------	------	------	1
Total	1,880	3,322	2,832	86	416	130	7	2	17	13	96
Same week, 1947	3,322	------	------	29	250	212	9	2	14	27	97
Median, 1943-47	2,832	------	------	35	323	107	11	7	11	45	[8] 97
17 weeks: 1948	36,738	------	------	1,174	4,757	3,097	144	13	308	234	1,547
1947	44,391	------	------	782	5,073	3,502	114	18	555	664	1,751
Median, 1943-47	42,080	------	------	510	4,939	1,739	142	18	285	782	[8] 1,466

[3] Period ended earlier than Saturday.
[8] 3-year median 1945-47.

Alaska, week ended Apr. 24: Influenza 4, mumps 2, pneumonia 3.
Territory of Hawaii, week ended May 1: Rabies 0, measles 4, scarlet fever 2, whooping cough 8.

WEEKLY REPORTS FROM CITIES*

City reports for week ended Apr. 24, 1948

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	1	------	0	1	0	0	0	0	9
New Hampshire:												
Concord	0	0	------	0	1	0	0	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	8	0	------	0	311	2	12	0	97	0	3	4
Fall River	0	0	------	0	10	0	1	0	0	0	0	3
Springfield	0	0	------	0	4	0	0	0	4	0	0	------
Worcester	0	0	------	0	25	0	14	0	11	0	0	1
Rhode Island:												
Providence	0	0	------	0	1	0	0	0	6	0	0	------
Connecticut:												
Hartford	0	0	------	0	------	0	2	0	6	0	0	------
New Haven	0	0	------	0	3	0	0	0	5	0	0	4
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	17	1	4	0	11	0	0	------
New York	7	1	5	2	1,554	2	80	1	77	0	4	30
Rochester	0	0	------	0	2	0	4	0	7	0	0	2
Syracuse	0	0	------	0	3	0	2	0	7	0	0	5
New Jersey:												
Camden	1	0	------	0	26	0	2	0	4	0	0	------
Newark	0	0	------	1	228	1	4	0	5	0	0	8
Trenton	0	0	------	0	11	0	4	0	2	0	0	------
Pennsylvania:												
Philadelphia	3	0	2	1	858	0	12	0	46	0	0	12
Pittsburgh	0	0	------	0	6	1	7	0	57	0	0	5
Reading	0	0	------	0	5	0	3	0	11	0	0	------
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	1	0	------	0	104	3	7	0	7	0	2	2
Cleveland	0	0	4	0	28	0	4	0	44	0	1	8
Columbus	0	0	------	0	53	0	2	0	8	0	1	2
Indiana:												
Fort Wayne	0	0	------	0	14	0	1	0	1	0	0	------
Indianapolis	0	0	------	0	224	0	1	0	8	0	0	1
South Bend	0	0	------	0	10	0	0	0	0	0	0	1
Terre Haute	0	0	------	0	------	0	1	0	0	0	0	------
Illinois:												
Chicago	0	0	2	2	722	0	21	0	37	0	0	22
Springfield	0	0	------	0	7	0	8	0	8	0	0	------
Michigan:												
Detroit	0	0	------	0	626	2	3	1	65	0	0	4
Flint	0	0	------	0	------	0	3	0	1	0	0	------
Grand Rapids	0	0	------	0	21	0	1	0	4	0	0	2
Wisconsin:												
Kenosha	0	0	------	0	78	0	0	0	0	0	0	------
Milwaukee	0	0	------	0	93	0	5	0	17	0	0	13
Racine	0	0	------	0	48	0	0	0	1	0	0	1
Superior	0	0	------	0	180	0	0	0	0	0	0	2
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	457	0	1	0	4	0	0	------
Minneapolis	2	0	------	0	34	1	3	0	8	0	0	------
St. Paul	1	0	------	0	44	1	1	0	0	0	2	7
Missouri:												
Kansas City	1	0	12	1	45	1	7	0	4	0	0	5
St. Joseph	0	0	------	0	------	0	0	0	0	0	0	------
St. Louis	0	0	2	0	227	1	17	0	4	0	0	5

*In some instances the figures include nonresident cases.

City reports for week ended Apr. 24, 1948—Continued

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	2	249	0	0	0	1	0	0	1
Kansas:												
Topeka	0	0	------	0	9	0	2	0	1	0	0	2
Wichita	0	0	------	0	2	0	3	0	1	0	0	3
SOUTH ATLANTIC												
Deleware:												
Wilmington	0	0	------	0	29	0	2	0	1	0	0	------
Maryland:												
Baltimore	3	0	2	0	113	0	5	0	5	0	0	3
Cumberland	0	0	------	0	------	0	0	0	4	0	0	------
Frederick	1	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	152	1	6	0	8	0	0	------
Virginia:												
Richmond	0	0	------	0	6	0	0	0	1	0	0	3
Roanoke	0	0	------	0	------	0	0	0	1	0	0	------
West Virginia:												
Charleston	0	0	------	0	12	0	6	0	0	0	0	------
Wheeling	0	0	------	0	39	0	0	0	0	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	0	3	0	0	0	0	------
Wilmington	0	0	------	0	------	0	2	0	1	0	0	------
Winston-Salem	0	0	------	0	------	0	0	0	4	0	0	2
South Carolina:												
Charleston	1	0	1	0	1	0	0	0	0	0	0	12
Georgia:												
Atlanta	0	0	------	0	5	0	4	0	3	0	4	------
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Savannah	0	0	------	0	------	0	0	0	0	0	0	1
Florida:												
Tampa	0	0	------	0	7	0	2	0	1	0	1	6
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	88	1	4	0	0	0	0	3
Nashville	1	0	------	0	1	0	2	0	0	0	0	5
Alabama:												
Birmingham	6	0	------	0	4	0	2	0	3	0	0	7
Mobile	0	0	------	0	------	0	3	0	0	0	1	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	3	0	0	0	1	0	0	2
Louisiana:												
New Orleans	0	0	7	2	4	0	6	0	1	0	2	2
Shreveport	0	0	------	0	------	0	3	0	0	0	0	------
Oklahoma:												
Oklahoma City	0	0	------	0	11	0	3	0	3	0	0	1
Texas:												
Dallas	0	0	------	0	178	0	0	0	5	0	0	2
Galveston	0	0	------	0	3	0	1	0	0	0	0	------
Houston	0	0	3	0	------	0	5	0	3	0	0	2
San Antonio	1	0	------	0	22	0	8	1	0	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	2	0	5	0	0	0	0	------
Great Falls	0	0	------	0	------	0	0	0	0	0	0	------
Helena	0	0	------	0	------	0	0	0	1	0	0	------
Missoula	1	0	------	0	------	0	0	0	0	0	0	4
Idaho:												
Boise	0	0	------	0	------	0	2	0	0	0	0	------
Colorado:												
Denver	0	0	1	0	297	2	6	0	4	0	0	15
Pueblo	0	0	------	0	10	0	2	0	2	0	0	6
Utah:												
Salt Lake City	0	0	------	0	75	0	2	0	2	0	0	

City reports for week ended Apr. 24, 1948—Continued

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	2	0	------	0	72	0	5	0	8	0	0	3
Spokane	0	0	------	0	9	0	2	0	8	0	0	------
Tacoma	1	0	------	0	23	0	0	0	2	0	0	1
California:												
Los Angeles	2	0	4	0	261	0	7	0	12	0	0	8
Sacramento	0	0	------	0	------	0	1	0	2	0	0	18
San Francisco	1	0	1	0	285	1	4	1	14	0	1	2
Total	44	1	46	12	8,052	21	346	4	680	0	22	267
Corresponding week, 1947[1]	56	------	165	35	1,981	------	404	------	568	1	8	736
Average 1943–47[1]	68	------	121	[2] 25	[3] 6,676	------	[2] 360	------	1,467	1	12	650

[1] Exclusive of Oklahoma City. [2] 3-year average 1945–47. [3] 5-year median 1943–47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (latest available estimated population, 34,410,800)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Tyhpoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	22.6	0.0	0.0	2.8	1,004	5.7	84.9	0.0	365	0.0	8.5	59
Middle Atlantic	5.1	0.5	3.2	1.9	1,254	2.3	56.5	0.5	105	0.0	1.9	29
East North Central	0.6	0.0	3.6	1.2	1,343	3.0	34.7	0.6	122	0.0	2.4	35
West North Central	8.0	0.0	28.2	6.0	2,146	8.0	68.4	0.0	46	0.0	4.0	46
South Atlantic	8.3	0.0	5.0	0.0	602	1.7	49.6	0.0	48	0.0	8.3	45
East South Central	41.3	0.0	0.0	0.0	549	5.9	64.9	0.0	18	0.0	5.9	89
West South Central	2.5	0.0	25.4	5.1	561	0.0	66.0	2.5	33	0.0	5.1	23
Mountain	7.9	0.0	7.9	0.0	3,050	15.9	135.0	0.0	71	0.0	0.0	199
Pacific	9.5	0.0	7.9	0.0	1,028	1.6	30.0	1.6	73	0.0	1.6	43
Total	6.7	0.2	7.0	1.8	1,223	3.2	52.6	0.6	103	0.0	3.3	41

Dysentery, amebic.—Cases: New York 14; New Orleans 5; Los Angeles 3; San Francisco 1.
Dysentery, bacillary.—Cases: Worcester 1; Winston-Salem 1; Los Angeles 1.
Leprosy.—Cases: Los Angeles 1.

TERRITORIES AND POSSESSIONS

Virgin Islands of the United States

Notifiable diseases—January–March 1948.—During the months of January, February, and March, 1948, cases of certain notifiable diseases were reported in the Virgin Islands of the United States as follows:

Disease	January	February	March	Disease	January	February	March
Chickenpox	------	------	10	Mumps	16	12	25
Dysentery, unspecified	2	------	------	Pneumonia	4	------	1
Filariasis	4	------	3	Syphilis	7	9	7
Gonorrhea	12	8	6	Tuberculosis, pulmonary	1	1	------
Hookworm disease	1	5	6	Typhoid fever	2	------	------
Measles	2	------	8				

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended April 10, 1948.—During the week ended April 10, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox	---	37	---	289	232	75	11	22	82	748
Diphtheria	1	---	---	21	1	1	---	5	---	29
Encephalitis, infectious	---	---	---	---	1	---	---	---	---	1
German measles	---	3	---	27	14	1	---	2	10	57
Influenza	---	17	---	---	44	3	---	---	70	134
Measles	---	---	---	855	1,149	6	7	32	72	2,121
Meningitis, meningococcus	---	1	---	2	---	1	---	---	---	4
Mumps	---	9	---	302	295	77	71	25	7	786
Poliomyelitis	---	---	---	---	---	1	---	---	---	1
Scarlet fever	2	1	1	42	86	5	1	5	5	148
Tuberculosis (all forms)	---	8	3	127	38	15	3	37	100	331
Typhoid and paratyphoid fever	2	---	---	2	---	---	1	---	---	5
Undulant fever	---	---	---	3	1	---	---	1	3	8
Venereal diseases:										
Gonorrhea	1	14	11	112	73	21	23	38	72	365
Syphilis	1	12	6	50	51	12	6	7	23	168
Whooping cough	---	---	---	48	17	16	5	23	4	113

CUBA

Habana—Communicable diseases—5 weeks ended April 3, 1948.—During the 5 weeks ended April 3, 1948, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chickenpox	14	---	Poliomyelitis	1	---
Diphtheria	37	---	Tuberculosis	4	5
Malaria	5	---	Typhoid fever	18	---
Measles	29	1			

Provinces—Notifiable diseases—5 weeks ended April 3, 1948.—During the 5 weeks ended April 3, 1948, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	8	14	7	26	---	23	78
Chickenpox	---	14	11	1	4	11	41
Diphtheria	---	44	---	1	---	3	48
Hookworm disease	---	20	---	---	---	---	20
Leprosy	1	3	---	---	---	2	6
Malaria	6	6	1	---	3	1	17
Measles	4	28	2	9	---	6	49
Poliomyelitis	---	1	---	1	---	---	2
Tuberculosis	26	19	14	14	5	22	100
Typhoid fever	18	27	3	23	6	33	110
Typhus fever (murine)	---	---	1	---	---	---	1
Whooping cough	---	53	---	---	2	---	55

---

[1] Includes the city of Habana.

FINLAND

Notifiable diseases—February 1948.—During the month of February 1948, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	12	Poliomyelitis	7
Diphtheria	203	Scarlet fever	303
Gonorrhea	870	Syphilis	300
Malaria	2	Typhoid fever	36
Paratyphoid fever	159		

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

India—Calcutta.—For the week ended April 24, 1948, 435 cases of cholera were reported in Calcutta, India.

Indochina (French)—Cochinchina—Saigon.—Cholera has been reported in Saigon, Cochinchina, French Indochina, as follows: For the week ended April 17, 1948, 12 cases; for the week ended April 24, 1948, 12 cases.

Pakistan—West Punjab Province—Lahore District.—Information dated April 30, 1948, states that an outbreak of cholera has been reported in Lahore District, West Punjab Province, India. During the month of April 1948, 1,355 cases with 229 deaths were reported in this area. The outbreak was stated to be confined to refugee camps, with a few stray cases reported in the city of Lahore. Cases have been reported in Lahore City as follows: Week ended April 17, 6 cases; week ended April 24, 10 cases.

Plague

Venezuela—Aragua State—Tejerias.—For the week ended May 1, 1948, 3 fatal cases of plague were reported in Tejerias, Aragua State, Venezuela.

Smallpox

China—Shanghai.—For the week ended April 24, 1948, 69 cases of smallpox were reported in Shanghai, China.

Colombia.—For the period March 1–31, 1948, 879 cases of smallpox with 11 deaths were reported in Colombia.

India—Calcutta.—For the week ended April 24, 1948, 129 cases of smallpox were reported in Calcutta, India.

Indochina (French)—Cochinchina—Saigon.—For the week ended April 24, 1948, 19 cases of smallpox were reported in Saigon, Cochinchina, French Indochina.

Typhus fever

Colombia.—During the month of March 1948, 264 cases of typhus fever with 5 deaths were reported in Colombia.

DEATHS DURING WEEK ENDED APR. 24, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Apr. 24, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	9,210	9,434
Median for 3 prior years	9,434	
Total deaths, first 17 weeks of year	170,534	170,947
Deaths under 1 year of age	659	733
Median for 3 prior years	631	
Deaths under 1 year of age, first 17 weeks of year	11,738	13,548
Data from industrial insurance companies:		
Policies in force	71,079,535	67,304,615
Number of death claims	13,134	14,060
Death claims per 1,000 policies in force, annual rate	9.7	10.9
Death claims per 1,000 policies, first 17 weeks of year, annual rate	10.2	10.0

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948
For sale by the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C.
Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 **MAY 28, 1948** NUMBER 22

IN THIS ISSUE

Leprosy in California

Public Health Service Publications

Incidence of Communicable Disease in the U. S.

FEDERAL SECURITY AGENCY

PUBLIC HEALTH SERVICE

FEDERAL SECURITY AGENCY
Oscar R. Ewing, Administrator

PUBLIC HEALTH SERVICE
Leonard A. Scheele, Surgeon General

Division of Public Health Methods
G. St. J. Perrott, Chief of Division

CONTENTS

Page
Leprosy in California—Danger of Infection. G. W. McCoy 705
Incidence of Communicable Disease in the United States March 28–April 24, 1948 712
Public Health Service Publications. A list of publications issued during the period July–December 1947 716

INCIDENCE OF DISEASE

United States:
    Reports from States for week ended May 8, 1948, and comparison with former years 722
    Weekly reports from cities:
        City reports for week ended May 1, 1948 726
        Rates, by geographic divisions, for a group of selected cities 728
    Plague infection in Arizona, New Mexico, and Washington 728
    Territories and possessions:
        Panama Canal Zone—Notifiable diseases—March 1948 729
Foreign reports:
    Canada—Provinces—Communicable diseases—Week ended April 17, 1948 730
    Northern Rhodesia—Smallpox 730
    World distribution of cholera, plague, smallpox, typhus fever, and yellow fever—
        Cholera 731
        Plague 732
        Smallpox 732
        Typhus fever 734
        Yellow fever 735
Deaths during week ended May 1, 1948 735

Public Health Reports

Vol. 63 • MAY 28, 1948 • *No. 22*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

LEPROSY IN CALIFORNIA—DANGER OF INFECTION

G. W. McCoy, M. D.

Reports on the prevalence of leprosy often do not disclose where the infection was acquired. This is important in connection with control measures if the case is found in an area in which transmission to the public is likely to occur. With new interest being taken in this disease by health authorities in the United States, it is desirable to know the danger of spread in different areas. This seemed especially important for California where many cases have been reported. Among 475 cases reported up to 1940, probably not more than 14 had been infected in the State (*1*). The present investigation was undertaken to obtain more comprehensive and more recent data. California stands almost alone among the States in being geographically situated for receiving infection from two general sources. The proximity to Mexico, which has many cases, has resulted in the entrance of a very considerable number of cases from that country. The State is the most convenient port of entry for Hawaii, Japan, and other Pacific islands, as well as China, which has resulted in the importation of a smaller but considerable number of cases. These undoubtedly included active cases and probably a larger number in the incubation stage.

At the time California became a part of the United States (1850), the natives, excluding Indians, were designated as Hispano-Californians (Mexicans) and constituted a large part of the population. A number of native Hawaiians came to the State soon after discovery of gold (1848), and at about the same time Chinese began to come in large numbers. Doubtlessly, both immigrations brought leprosy with them. The first readily available reference to the disease in California is a report by the jail physician of San Francisco in 1877, who mentioned treatment of 3 cases of "leprosis." A little later the State health officer of the day, Dr. H. S. Orme, in an annual report (*2*) included the following statistical data on lepers in San Francisco from 1871 to 1890, based on California State Board of Health reports from 1886 to 1894:

Year of admission:	Cases	Year of admission:	Cases	Year of admission:	Cases
1871	1	1878	13	1885	7
1872	1	1879	14	1886	6
1873	1	1880	10	1887	3
1874	6	1881	2	1888	3
1875	9	1882	12	1889	12
1876	3	1883	11	1890	5
1877	0	1884	9	Total	[1] 128

[1] Of this total, 115 were Mongolians, 12 whites and 1 mixed; 120 were males and 8 females.

Birthplaces were recorded as follows:

China	114	England	1	Japan	1
Honolulu	1	Sweden	1	Germany	1
United States	3	France	1	Mexico	1

These figures show an overwhelming predominance of Chinese and an extraordinary excess of males. Nearly everywhere the number of male victims is much larger than females, the ratio generally being about 2:1. The very great excess shown in California in those early years doubtlessly resulted from confining Chinese immigration largely to males. Dr. Orme also wrote "Long ago the people of California recognized the danger of planting leprosy on this coast through Chinese immigration, and for more than 15 years legislation gave abundant authority for its exclusion and repression. Section 2952 of the Political Code reads: 'It shall not be lawful for lepers or persons affected with leprosy, or elephantiasis, to live in ordinary intercourse with the population of this State; but all persons shall be compelled to inhabit such lazarettos, or leper's quarters, as may be assigned to them by the Board of Supervisors of the city or county in which they shall be domiciled or settled; and the Boards of Supervisors are vested with power and are required to make all necessary provisions for the separation, detention, and care of lepers or persons affected with leprosy, or elephantiasis, settled or domiciled in their respective cities or counties.'

"In 1883," Dr. Orme continued, "the Board of Supervisors of San Francisco supplemented the above act by an order which forbids positively the landing of lepers from any ship, their transfer to another vessel, and their harboring by any person outside the lazaretto." There is nothing to indicate that the cases referred to by Dr. Orme gave rise to any new infections.

It has long been known that California furnishes a large proportion of the cases of leprosy reported in the United States and, according to Hopkins and Faget (*3*), the State with 207 cases ranks third in the number of cases sent to the National Leprosarium at Carville, La., being exceeded only by Louisiana with 596 cases and Texas with 214 for the period 1921–44. Until this study, there seems to have been no special attempt to determine how many, if any, of the cases reported for California were infected there. Comparatively recently, when most health authorities began the adoption of new and more intelligently directed policies in dealing with this disease, it became important to know where leprosy is communicated from the sick to the well, in addition to where it is found. Florida, Louisiana, and Texas have long been recognized as areas in which leprosy spreads enough to be a public health problem and in recent years there has been a tendency to group California with these States as an "endemic" area. With the object only of ascertaining the status of the State as an area in which this disease was transmitted, this study was made. When data on any case indicated that in all probability the infection had been acquired elsewhere than in California, no further attention was given to it. This course was adopted because there was no intention of making a complete study, but only of the cases that could reasonably be regarded as having been infected in this State.

When this investigation began in California in July 1947, the State Health Department was engaged in a general statistical study of leprosy in California which was to be prepared for publication. The data for that study were generously placed at my disposal and found of much value. The figures were for the period 1906–1947, and covered a total of approximately 500 cases reported in the State.

The tracing of source and place of infection in communicable diseases usually is carried out by ascertaining the place and the time of exposure, giving consideration to the incubation period. Perhaps the best illustration of this is to be found in tracing the source of venereal disease in a control program. Another example is smallpox. Look for the infecting smallpox patient among the victim's contacts 12 to 14 days previous to onset. If his contacts can be traced, the infecting patient should be found.

It is the widely accepted view that leprosy is usually acquired in the early years of life. Determining the source and the place of infection in leprosy is, therefore, often difficult and frequently impossible, chiefly for two reasons: First, the manifestations in the infecting patient may be obscure and the diagnosis in the new patient uncertain for long periods, even many years; secondly, the incubation period is long and varying and may average from 8 to 10 years. However, some authorities feel that it may be prolonged to 25 years or longer. In this study, if the patient had lived in Hawaii, or the Philippines, or a similar recognized area of high leprosy prevalence, this was regarded as the place where the disease probably was acquired. A few years' residence in either of these Pacific Island groups was considered sufficient to attribute the infection to that area. If the patient had been born in Mexico, and had spent the early years of life in that country, Mexico was considered the probable place of infection even if a longer period later in life had been spent in California.

The following procedures have been utilized in this study. Patients admitted from California to the National Leprosarium at Carville, La., and who remained there, were interviewed in May 1947. Among 74 such cases 7 could be assigned to California as the place of infection. The records of the California State Department of Health were studied in July and August 1947. They were so complete that not much difficulty was encountered in allocating cases to a place of probable infection. The State records included most of the patients who had been interviewed at Carville in May 1947.

In recent years, the attitude of California health authorities in general has been very enlightened and progressive with respect to the public health management of the disease. While patients regarded as possible (or probable) sources of infection have been sent to the National Leprosarium at Carville, La., very little compulsion has been employed. Patients judged not to be a menace to those about them often have been allowed to remain at home, in local hospitals, or under the care of local physicians. Patients of Mexican origin who preferred to return to their native land were permitted to and informal arrangements for receiving the deportees were even facilitated by the State or local authorities with Mexican authorities.

CASE STUDIES

The family groups with leprosy (excluding marital) appeared to present the clearest evidence of infection within the State. Three of these are of special interest as the cases charged to the State never had been outside California:

(1) K family: A mother, born in Japan, came to the United States when 14 years old and developed leprosy 15 years later. At the time of diagnosis she was classified as an active case of leprosy. Her husband, also born in Japan and the father of her 6 sons, was rated as an old inactive case, but the evidence in his case is not conclusive. The sons who contracted the disease were their third, age 12, the fifth, age 9, and the sixth, age 8.

(2) S family: The first case in this family was the father who died of leprosy in 1928 and never had been out of the State. Ten years later a son, age 17, was infected. He also had never been out of California.

(3) F family: The father in this family had military service in the Philippine Islands (1899–1900) and had developed leprosy after his return, dying in 1912. His two sons, one born in 1901 and the other in 1902, developed the disease, one at age 16 and the other at 17. Both had lived at home with the father until 18 months before his death. A daughter is said to have escaped infection.

Another familial case centers about Mrs. M. P., age 40, who was found to have advanced leprosy in 1932. She was born and probably infected in Mexico. She died of pneumonia apparently while hospitalized for leprosy. A short time later a daughter, I. P., age 6, who had never lived out of California, was discovered to have early leprosy.

ADULT INFECTIONS

Almost as clear examples of adult infection within the State are at least two patients who had lived only in California, except for limited periods in areas where the disease never has been known to be transmitted:

A young adult male (G. P.) who had been out of California only for 3 years while serving as a sailor in Alaska and Alaskan waters; a woman (M. B.), age 48, whose only residence outside California was 7 years spent in Utah. Neither Alaska nor Utah is considered as a probable area of leprosy transmission.

Marital infections.—In the three instances in which husband and wife were reported to have leprosy, the marital partner first to present evidence of the disease was regarded, perhaps somewhat arbitrarily, as the source of infection for the mate. In one family it was not possible to reach any reasonably clear conclusion on this point. In all of the marital infections, the evidence is not so convincing since both partners had been born outside California. If the view of infection of one from the other had not been adopted, it would have been necessary to assume the coincidence that both partners had been infected abroad. Three marital infections in so small a total is a much larger number than is to be expected and throws doubt on some, or all of them.

The K. family: both partners previously mentioned were born in Japan and spent their early years there. It was impossible to be certain that either one was infected in California, but the probability appears to point in that direction. The alternative is to consider that both were infected in Japan.

The S. family: Mrs. M. S. was born in Mexico and came to California at the age of 28. Nine years after coming to the State she was found to have well-advanced leprosy of the lepromatous type. Her husband, S. S., age 49, was born in Mexico. He spent the first 5 years of his life in Mexico and the remaining 44 years in California. The disease appeared about 1 year before the diagnosis of the maculo-anesthetic form was made; that is, 43 years after coming to the United States.

The R. family: Mr. J. R., age 49, was born in Mexico. He came to California at the age of 31 and was reported as having leprosy 18 years later. The disease was classified as "mixed" of long duration. His wife Jo. R., age 41, was born in Mexico and had lived in California 14 years. Her case was recorded as "macular leprosy, early."

Certain data on the 23 cases important to the present inquiry are shown in the following tabulation:

TABLE 1.—*Leprosy infection in Californians who never left the State, probably acquired in California*

Year reported	Initials	Sex	Location	Source of infection
1919	T. F	Male	Stockton	Father.
1919	W. F	do	do	Do.
1925	H. S	do	Walnut Grove	Unknown.
1932	I. P	Female	Tulare County	Mother.
1938	J. S	Male	Walnut Grove	Father.
1941	A. K	do	Sacramento	Mother.
1941	W. K	do	do	Do.
1941	K. K	do	do	Do.

TABLE 2.—*Leprosy infection in persons never out of State except to areas where disease is not known to be communicated*

Year	Initials	Sex	Location	Birthplace	Residence	Number of years outside State
1921	G. P	Male	San Leandro	California	Alaska	3
1943	M. B	Female	Angels Camp	California	Utah	7

TABLE 3.—*Cases where marital partner is probable source of infection*

Year reported	Initials	Sex	Location	Birthplace	Probable source of infection
1929	Y. K	Female	Sacramento	Japan	Husband.
1939	S. S	Male	Carlsbad	Mexico	Wife.
1941	J. R	Female	Mount Shasta	do	Husband.

TABLE 4.—*Cases believed to indicate infection in the State*

Year	Initials	Sex	Location	Birthplace	Residence outside the State
1926	M. L	Female	Decoto	(1)	(1)
1930	E. L	Male	Los Angeles	Calif	None.
1931	J. S	do	Los Angeles area.	do	Mexico, 1 day (7 years prior to onset).
1935	C. R	do	Hanford	do	None.
1935	R. S	do	San Francisco	do	(1)
1939	A. M	do	do	do	Pennsylvania, Oregon, Montana, Vancouver 5 years.
1943	A. S	do	(1)	do	Mexico before age 9.
1945	D. M	do	Oakland	Spain	Spain first year of life.
1946	R. M	Female	Fresno	Arizona	Arizona first year of life.
1947	E. H	do	Los Angeles area.	Ohio	Ohio for first 50 years.

(1) Not known.

In comparing the incidence of intrastate infected cases with the total number that were reported for periods for which data are available, the figures are as follows:

Period	Total cases reported	Probably infected in State
1913–1916	43	0
1917–1921	112	3
1922–1926	100	2
1927–1931	102	3
1932–1936	68	3
1937–1941	54	7
1942–1946	49	4

The period 1937–1941 includes the three children in one family. One case of within-State infection was omitted from this table as it was reported in 1947.

The figures show a tendency of total reported cases to be falling in recent years. The largest number for any one year was 28 in 1921. Intrastate infections do not vary much for the period under consideration.

CLASSIFICATIONS OF AREAS OF INFECTIVITY

The prevalence of leprosy in the United States by classifying areas is as follows:

(1) *Highly endemic.*—All or the great majority of cases being infected in the State—Louisiana and Florida.

(2) *Markedly endemic.*—A large proportion of the cases being infected in the State—Texas.

(3) *Mildly endemic.*—A very small proportion of all cases being infected in the State—Minnesota.

(4) *Feebly endemic.*—Only occasional cases occurred at long intervals—South Carolina.

In such a grouping California would fall in the class of mildly endemic along with Minnesota. Minnesota has had 7 cases of local origin among a total of 100 or more, while in California the figures are approximately 23 among about 500—a rather suggestive similarity between the two States.

When the data are examined from the point of view of locality in the State where infection occurred, it is found that eight of the cases came from a comparatively small area near the middle of the State as follows:

Sacramento—4 cases in one family—mother, 3 children
Walnut Grove—2 cases in one family—father, 1 child
Stockton—2 cases in one family—2 brothers

These are from an area with a radius of about 30 miles. Of the 8 cases, 6 were children in families with a leprous parent.

The experience of California seems to agree to a considerable extent with that of Minnesota where the number of cases acquiring the disease in the State was far outnumbered by imported cases. There is one important difference between the two States. In California, leprosy continues to be introduced with the importation of patients or persons in the incubation period from Mexico and the Pacific area, while in Minnesota, an end to the admission of new cases came about the beginning of the 20th century.

SUMMARY

An investigation having a very limited objective, shows the following: That 23 persons in the present century have acquired leprosy in California. Of these, seven never had been out of the State. About these seven there can be no doubt as to the place of infection. The remainder are less positively attributed to infection in the State but this is believed to be established beyond reasonable doubt.

The majority of all cases are due to infection in Mexico, China, and the Pacific Islands.

California is to be regarded as an area in which the likelihood of transmission of leprosy is small, except for children born of parents, one or both of whom have the disease.

ACKNOWLEDGMENT

The author wishes to express his indebtedness for aid to Miss Ida M. Stevens and Mr. Guy P. Jones, of the California State Health Department; to R. C. Williams, Assistant Surgeon General; to F. A. Johansen, Medical Director; and M. V. Hargett, Senior Surgeon, Public Health Service.

REFERENCES

(*1*) McCoy, G. W.: Observations on the epidemiology of leprosy, Pub. Health Rep. **57:** 1935 (1942).

(*2*) Orme, H. S.: Report of State Board of Health of California June 30, 1888–June 30, 1890, page 211.

(*3*) Hopkins, Ralph, and Faget, G. H.: Recent trends in leprosy in the United States, J. A. M. A. **126:** 937 (1944).

INCIDENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

March 28–April 24, 1948

The accompanying table summarizes the incidence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in PUBLIC HEALTH REPORTS under the section "Incidence of Disease." The table gives the number of cases of these diseases for the 4 weeks ended April 24, 1948, the number reported for the corresponding period in 1947, and the median number for the years 1943–47.

DISEASES ABOVE MEDIAN INCIDENCE

Influenza.—The reported number of cases of influenza dropped from 25,459 during the preceding 4 weeks to 10,095 for the 4 weeks ended April 24. Of the total cases Texas reported 4,393, South Carolina 1,486, and Virginia 1,138—70 percent of the total cases occurred in those 3 States. The recent rise of this disease has been confined to States in the Southern and Western sections of the country. In the East South Central, Mountain and Pacific sections the incidence has dropped nearly to the level of the preceding 5-year median, but in the South Atlantic and West South Central sections the numbers of cases are still relatively high. The incidence for the country as a whole was less than 10 percent of the 1947 figure for the same weeks, but it was about 17 percent above the 1943–47 median incidence. The peak of the recent outbreak was reached during the month of January while the peak of the 1947 epidemic was not reached until March, with very little drop in the number of cases during the month of April.

Poliomyelitis.—While the number of cases of poliomyelitis was not large, it represented an increase of more than 10 percent over the median for the preceding 5 years, and with the exception of the year 1945, when 128 cases were reported for these same 4 weeks, the current incidence was the highest for the corresponding weeks in the 20 years for which data are available in this form. Each section of the country except the North Atlantic, East South Central, and Pacific sections reported an excess of cases over the normal seasonal median. While an increase of this disease may be expected at this season of the year, in most preceding years the increase has not occurred until sometime during the month of May; the lowest incidence of the season has normally been reached during the 4 weeks corresponding to the period under consideration.

DISEASES BELOW MEDIAN INCIDENCE

Diphtheria.—For the 4 weeks ended April 24 there were 610 cases of diphtheria reported. The median number for the preceding 5 years was 922. For the country as a whole the current incidence was the lowest on record for this period. In the Mountain section the number of cases (75) was 50 percent above the seasonal expectancy, but in all other sections the incidence was relatively low.

Measles.—The number of reported cases of measles rose from 83,160 during the preceding 4 weeks to 102,680 during the current 4-week period. The incidence was 3.6 times that reported for the corresponding period in 1947, but it was slightly below the median for the preceding 5 years (104,809 cases). Significant increases over the normal seasonal incidence were reported from the East North Central, West South Central, Mountain, and Pacific sections. In other sections the incidence was about the same or below the preceding 5-year medians.

Meningococcus meningitis.—The number of cases (285) of meningococcus meningitis was less than 75 percent of the number reported for the corresponding period in 1947 and about 36 percent of the median for the preceding 5 years. In the Mountain section the incidence was the same as the median but in all other sections the incidence was considerably below the 1943–47 median. For the country as a whole the current incidence was the lowest since 1941 when 225 cases were reported for these same weeks. The current incidence compares very favorably with the average number of cases (approximately 275) for non-epidemic years, the 1943–47 median contains 3 years of unusually high meningitis incidence.

Scarlet fever.—This disease continued on its downward trend, the number of cases (8,312) reported for the 4 weeks ended April 24 being below the record low incidence of 1947 (9,898 cases). In each section of the country the current incidence was considerably below the normal seasonal incidence. This disease has been on a steady decline since 1944 and for this particular period the incidence was the lowest in the 20 years for which these data are available.

Smallpox.—Kansas and North Carolina each reported 2 cases of smallpox and Nebraska, Wyoming, and Arizona one each during the current 4 weeks. There were 38 cases reported during the corresponding period in 1947 and the median for the preceding 5 years was 54 cases. During this period in 1947 there was a slight outbreak of smallpox around New York City, the first outbreak in New York State since 1939, and 13 cases were also reported from Texas during these weeks. For the country as a whole the current incidence is the lowest on record for this period.

Typhoid and paratyphoid fever.—The number of cases of these diseases increased from 166 cases during the preceding 4 weeks to 225 during the current 4-week period. The number of cases was 1.4 times the 1947 incidence for the same weeks and slightly below the median for the preceding 5 years. The greatest increases over the 1947 figures occurred in the South Atlantic and West South Central sections with minor increases in all other sections except the New England, Mountain, and Pacific sections. Compared with the preceding 5-year median, the current incidence was higher than the median in the New England, West North Central, South Atlantic, and West South Central sections; in other sections the numbers of cases were about the same or below the medians.

Whooping cough.—For the 4 weeks ended April 24 there were 8,001 cases of whooping cough reported, as compared with 10,545 in 1947 and a median of 10,035 for the corresponding weeks in the preceding

5 years. In the West South Central section the number of cases (2,172) was 1.9 times the seasonal expectancy and a few more cases than might normally be expected occurred in the West North Central and Mountain sections, but in all other sections the incidence was relatively low.

MORTALITY, ALL CAUSES

For the 4 weeks ended April 24 there were 37,407 deaths from all causes reported to the National Office of Vital Statistics by 93 large cities. The median number for the years 1945–47 was 36,731 deaths. During the first 2 weeks of the 4-week period the number of deaths was considerably above the preceding 3-year median, but during each of the last 2 weeks the number was lower than the median. For the entire 4-week period the increase over the median was about 1.8 percent.

Number of reported cases of 9 communicable diseases in the United States during the 4-week period March 28–April 24, 1948, the number for the corresponding period in 1947, and the median number of cases reported for the corresponding period, 1943–47

Division	Current period	1947	5-year median	Current period	1947	5-year median	Current period	1947	5-year median
	Diphtheria			Influenza [1]			Measles		
United States	610	922	922	10,095	120,721	8,650	102,680	28,280	104,809
New England	21	47	32	7	225	108	5,840	7,076	7,487
Middle Atlantic	63	165	163	72	119	72	20,492	4,328	20,955
East North Central	86	118	166	80	3,868	427	29,616	5,055	26,395
West North Central	39	85	70	114	14,564	108	7,401	1,444	7,441
South Atlantic	124	170	131	2,878	36,811	2,486	5,349	4,369	7,035
East South Central	54	88	85	635	9,740	606	2,161	1,465	3,182
West South Central	90	127	152	5,279	48,582	4,277	11,332	2,070	5,963
Mountain	75	49	50	664	4,946	609	5,269	1,401	4,643
Pacific	58	73	125	366	1,866	344	15,220	1,072	7,945
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	285	383	794	126	112	111	8,312	9,898	17,096
New England	10	12	39	0	2	2	916	899	2,211
Middle Atlantic	52	57	155	16	20	19	2,374	2,769	5,679
East North Central	61	85	152	19	13	10	2,645	2,971	4,247
West North Central	21	37	72	19	9	5	595	824	1,552
South Atlantic	48	68	122	16	9	9	463	645	1,340
East South Central	37	38	68	6	9	9	187	419	475
West South Central	25	45	73	31	18	20	197	195	492
Mountain	10	6	10	5	1	3	287	395	855
Pacific	21	35	103	14	31	21	648	781	1,061
	Smallpox			Typhoid and paratyphoid fever			Whooping cough		
United States	7	38	54	225	161	241	8,001	10,545	10,035
New England	0	0	0	24	24	9	532	824	932
Middle Atlantic	0	13	0	16	15	37	915	1,738	1,738
East North Central	0	3	7	24	18	27	1,199	2,110	1,476
West North Central	3	2	8	15	13	10	516	318	318
South Atlantic	2	0	2	58	26	52	1,084	1,363	1,533
East South Central	0	5	4	22	16	23	326	588	463
West South Central	0	15	8	48	25	40	2,172	2,313	1,160
Mountain	2	0	2	1	4	15	659	324	474
Pacific	0	0	6	17	20	20	598	967	967

[1] New York, North Carolina, and Pennsylvania excluded; New York City and Philadelphia included.

PUBLIC HEALTH SERVICE PUBLICATIONS

List of Publications Issued During July–December 1947

The purpose of this list is to provide a complete and continuing record of Public Health Service publications for reference use by librarians, scientific workers, and others interested in particular fields of public health work, and not to offer the publications for indiscriminate free distribution.

Single sample copies are available from the Public Inquiries Section, Office of Health Information, Public Health Service, Washington 25, D. C.

Quantities may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at prices shown, with a reduction of 25 percent on lots of 100 copies or more of a single publication.

The publications marked with an asterisk (*) may be obtained only by purchase.

Periodicals

*Public Health Reports (weekly), July–December, vol. 62, Nos. 27 to 52. Pages 969 to 1812. 10 cents a number. Subscription price $4 a year.

Extracts from Public Health Reports (monthly), July–December, Tuberculosis Control Issues Nos. 17 to 22. 30 pages each. 10 cents a number. Subscription price $1 a year.

*The Journal of Venereal Disease Information (monthly), July–December, vol. 28, Nos. 7 to 12. Pages 129 to 298. 10 cents a number. Subscription price 75 cents a year.

*Journal of the National Cancer Institute (bimonthly), August–December, vol. 8, Nos. 1 to 3. Pages 1 to 159. 40 cents a number. Subscription price $2 a year.

Public Health Engineering Abstracts (monthly), July–December, vol. XXVII, Nos. 7 to 12. 32 pages each. No sales stock.

Industrial Hygiene Newsletter (monthly), July–December, vol. 7, Nos. 7 to 12. 16 pages each. 10 cents a number. Subscription price $1 a year.

National Negro Health News (quarterly), July–December, vol. 15, Nos. 3 and 4. 24 pages each. No sales stock.

Reprints from the Public Health Reports

2795. "Albumin-bacterioplasma conjugates" with special reference to the etiology of rheumatic fever. By Mark P. Schultz and Edythe J. Rose. July 11, 1947. 14 pages. 5 cents.

2796. Public Health Service publications. A list of publications issued during the period July–December 1946. July 11, 1947. 5 pages. 5 cents.

2797. Comparison of the spirocheticidal activity of arsphenamines and phenarsines (Arsenoxides) in experimental syphilis. By T. F. Probey. July 18, 1947. 8 pages. 10 cents.

2798. Toxic effects of tetranitromethane, a contaminant in crude TNT. By Rudolph F. Sievers, Edward Rushing, Helen Gay, and A. R. Monaco. July 18, 1947. 13 pages. 5 cents.

2799. Nutrition studies. I. Description of physical signs possibly related to nutritional status. By Harold R. Sandstead and Richmond K. Anderson. July 25, 1947. 13 pages. 5 cents.

2800. Mental hygiene in public health. By Paul V. Lemkau. August 8, 1947. 12 pages. 5 cents.
2801. Preliminary report on some organic materials as tick repellents and toxic agents. By James M. Brennan. August 8, 1947. 4 pages. 5 cents.
2802. State planning for participation in the National Mental Health Act. By R. H. Felix. August 15, 1947. 9 pages. 5 cents.
2803. DDT in oil as a mosquito larvicide. By Henry A. Johnson and Willis L. Goodman. August 15, 1947. 10 pages. 5 cents.
2804. Loss of virulence of *Treponema pallidum* during processing of dried blood serum. By T. F. Probey. August 15, 1947. 4 pages. 5 cents.
2805. Control of rabies. Report by the Committee on Public Health Relations of the New York Academy of Medicine. August 22, 1947. 24 pages. 10 cents.
2806. The family and dental disease. By Henry Klein. August 29, 1947. 8 pages. 5 cents.
2807. Effects of DDT mosquito larviciding on wildlife. Part II. Effects of routine airplane larviciding on bird and mammal populations. By Arnold B. Erickson. August 29, 1947. 11 pages. 5 cents.
2808. Dental services received by children in a New York clinic. By Isidore Altman. September 19, 1947. 18 pages. 10 cents.
2809. Studies on the air transmission of micro-organisms derived from the respiratory tract. By H. du Buy, F. A. Arnold, and B. J. Olson. September 26, 1947. 24 pages. 10 cents.
2810. A case of Q fever probably contracted by exposure to ticks in nature. By Carl M. Eklund, R. R. Parker, and David B. Lackman. September 26, 1947. 4 pages. 5 cents.
2811. Isolation of poliomyelitis virus from human serum by direct inoculation into a laboratory mouse. By Hilary Koprowski, Thomas W. Norton and Walsh McDermott. October 10, 1947. 10 pages. 5 cents.
2812. The effect of topically applied fluorides on dental caries experience. By Donald J. Galagan and John W. Knutson. October 10, 1947. 8 pages. 5 cents.
2813. Recovery of ornithosis virus from pigeons in Baltimore, Md. By Dorland J. Davis and C. Leroy Ewing. October 10, 1947. 5 pages. 5 cents.
2814. The effect of morphine addiction on blood, plasma, and "extra-cellular" fluid volumes in man. By Harris Isbell. October 17, 1947. 16 pages. 5 cents.
2815. Electron microscopy of tooth structure by the shadowed collodion replica method. By David B. Scott and Ralph W. G. Wyckoff. October 17, 1947. 8 pages; 8 illustrations. 10 cents.
2816. Statistical activities in State health departments. By Daniel D. Swinney. October 24, 1947. 12 pages. 5 cents.
2817. Sickness absenteeism among male and female industrial workers 1937–46, inclusive. By W. M. Gafafer. October 24, 1947. 4 pages. 5 cents.
2818. Vertebral body trephine. A preliminary report. By A. A. Michele and F. J. Krueger. August 8, 1947. 4 pages; 1 illustration. 5 cents.
2819. Births, infant mortality and maternal mortality in the United States—1944. By Nancy J. Brombacher. October 31, 1947. 20 pages. 10 cents.
2820. The role of health education in a public health program. By Mayhew Derryberry. November 14, 1947. 13 pages. 10 cents.
2821. Naturally occurring histoplasmosis in *Mus musculus* and *Rattus norvegicus*. By Chester W. Emmons, Joseph A. Bell, and Byron J. Olson. November 14, 1947. 5 pages. 5 cents.

2822. Opportunities for public health in disability insurance programs. By Milton I. Roemer. November 21, 1947. · 12 pages. 5 cents.
2823. Relationship between per capita income and mortality, in the cities of 100,000 or more population. By Marion E. Altenderfer. November 28, 1947. 12 pages. 5 cents.
2824. Contributions of the UNRRA sanitary engineering program to international health. By Frederick F. Aldridge. December 12, 1947. 12 pages. 5 cents.
2825. A report on the histopathology of the cutaneous lesions of a case of rickettsialpox. By Lloyd R. Hershberger and Robert J. Huebner. December 12, 1947. 5 pages; 3 illustrations. 5 cents.
2826. Dental caries prevalence and tooth mortality. A study of 24,092 Georgia children in 12 communities. By Thomas L. Hagan. December 19, 1947. 16 pages. 10 cents.
2827. Pteroylglutamic acid ("folic acid"), liver extract, and amino acids in the treatment of granulocytopenia in rats. By Floyd S. Daft. December 26, 1947. 8 pages. 5 cents.
2828. A serum protection test in tularemic infections in white rats. By Carl L. Larson. December 26, 1947. 8 pages. 5 cents.

Supplements to Public Health Reports

196. An evaluation of neurologic symptoms and findings occurring among TNT workers. By Rudolph F. Sievers. 1947. 26 pages. 20 cents.
197. Thallium. A review and summary of medical literature. By Francis F. Heyroth. 1947. 23 pages. 10 cents.
198. The incidence of rheumatic fever as recorded in general morbidity surveys of families. By Selwyn D. Collins. 1947. 59 pages. 15 cents.
199. Food handlers' schools in Hawaii. By B. J. McMorrow and F. A. Schramm. 1947. 37 pages. 17 illustrations. 15 cents.
200. Relation of plants to malaria control in Puerto Rico. By Harry D. Pratt. 1947. 39 pages; 10 illustrations. 10 cents.
201. Laboratory control of water supplies. By H. W. Streeter. 1947. 15 pages. 10 cents.
202. Problems of interpretation of the data of rodent-ectoparasite surveys and studies of rodent ectoparasites in Honolulu, T. H., Savannah, Ga., and Dothan, Ala. By LaMont C. Cole and Jean A. Koepke. 1947. 71 pages. 20 cents.
203. The toxicity and potential dangers of zinc phosphide and of hydrogen phosphide (phosphine). (A review of the nonsecret, nonconfidential and nonrestricted literature.) By W. F. von Oettingen. 1947. 17 pages. 10 cents.
180. Directory of State and Territorial health authorities, 1947. (1947 revision.) 51 pages. 15 cents.

Public Health Bulletins

296. Manual of recommended water-sanitation practice recommended by the United States Public Health Service 1946. 1947. 40 pages. 15 cents.
297. A review of the literature relating to affections of the respiratory tract in individuals exposed to cotton dust. By B. H. Caminita, William F. Baum, Paul A. Neal, and R. Schneiter. 1947. 86 pages. 25 cents.
298. Health of arc welders in steel ship construction. A survey made in cooperation with United States Maritime Commission and United States Navy. By Waldemar C. Dreessen, Hugh P. Brinton, Robert G. Keenan, Thalbert R. Thomas, Edwin H. Place, and James E. Fuller. 1947. 200 pages; 16 illustrations. 55 cents.

National Institute of Health Bulletin

189. Studies on schistosomiasis. By Willard H. Wright, Eloise B. Cram, Elmer G. Berry, Paul A. Ward, Dorothy Travis, Ruth E. Rue, Virginia S. Files, Myrna F. Jones, William B. Figgat, Frederick J. Brady, Walter L. Newton, S. R. Weibel, Harold B. Warren, Mary Louise Steinle, Mirriel S. Hummel, M. O. Nolan, Elizabeth Rogers Mann, Helen M. Churchill, John Bozicevich and Helen M. Hoyem. 1947. 212 pages. 50 cents.

Miscellaneous Publication

36. Better health for your community. Revised 1947. 12 pages. 5 cents.

Health Education Series

15. Menopause. 1947. 3 pages. 5 cents; $1 per 100.
20. Rocky Mountain spotted fever. 1947. 4 pages. 5 cents; $1 per 100.
24. Measles. 1947. 4 pages. 5 cents; $1 per 100.
27. Smallpox. 1947. 2 pages. 5 cents; $1 per 100.
28. Bronchial pneumonia. 1947. 2 pages. 5 cents; 75 cents per 100.

Community Health Series

From hand to mouth, No. 3. Revised 1947. 48 pages. 15 cents.

Unnumbered Publications

Index to Public Health Reports, vol. 62. Part 1, January–June 1947. 15 pages. 5 cents.

The physician in the U. S. Public Health Service. 1947. 20 pages, illustrated. 15 cents.

Free medical care for merchant seamen. 1947. 4 pages, illustrated. 5 cents.

Compilation of Public Health Service Regulations. Reprinted from Federal Register. September 16, 1947. 74 pages. (For official use only.)

Compilation of Public Health Service Regulations. Supplements Nos. 1–5, September 17 through October 11, 1947. 6 pages. (For official use only.)

Compilation of Public Health Service Regulations. Supplement No. 6, October 22, 1947. 27 pages. (For official use only.)

Compilation of Public Health Service Regulations. Supplements Nos. 7–10, October 24 through November 22, 1947. 2 pages. (For official use only.)

Reprints from the Journal of the National Cancer Institute

59. Inhibition of cathepsins of normal calf spleen and thymus. By Mary E. Maver and Antoinette Greco. October 1947. 4 pages. No sales stock.
60. Subcutaneous sarcomas in mice implanted with hydrocarbon-cholesterol pellets. By Michael B. Shimkin and Rose S. Wyman. October 1947. 4 pages. No sales stock.
61. Vascular reactions of normal and malignant tissues in vivo. II. The vascular reactions of the normal and neoplastic tissues of mice to a bacterial polysaccharide from *Serratia marcescens* (*Bacillus prodigiosus*) culture filtrates. By Glenn H. Algire, Frances Y. Legallais and Helen D. Park. October 1947. 10 pages; 4 illustrations. No sales stock.
62. Pulmonary-tumor induction by transplacental exposure to urethane. By C. D. Larsen. October 1947. 8 pages. No sales stock.
63. Enzymatic hydrolysis of homologous amino acid amides in normal and neoplastic tissues. By Maurice Errera and Jesse P. Greenstein. October 1947. 5 pages. No sales stock.
64. Note on benzoylarginineamidase activity in extracts of rat liver and hepatoma. By Jesse P. Greenstein and Florence M. Leuthardt. October 1947. 2 pages. No sales stock.

65. Effects of methylcholanthrene in pregnant mice. By L. C. Strong and W. F. Hollander. October 1947. 4 pages. No sales stock.
66. Procedure for the fixation, staining, and mounting of whole mounts from tissue cultures grown in Carrel D 3.5 flasks. By Wilton R. Earle. October 1947. 7 pages. No sales stock.

Reprints from The Journal of Venereal Disease Information

284. Some significant aspects of venereal-disease research. By J. F. Mahoney. July 1947. 4 pages. 5 cents.
285. The quantitative Kahn test. By Ad Harris. July 1947. 4 pages. 5 cents.
286. A revised note on quantitative Kahn tests employing 0.9 and 2.5 percent salt-solution systems. By Reuben L. Kahn. July 1947. 2 pages. 5 cents.
287. Preservation of sheep red cells for complement-fixation tests. I. An improved method. By J. Portnoy, H. N. Bossak, and Ad Harris. July 1947. 4 pages. 5 cents.
288. Treatment of the syphilitic pregnant woman with penicillin in oil-beeswax: A comparison with results obtained using aqueous sodium penicillin. By Norman R. Ingraham, Elizabeth Kirk Rose, Herman Beerman, Virgene S. Wammock, John H. Stokes, and Paul Gyorgy. August 1947. 8 pages. 5 cents.
289. Socioeconomic aspects of granuloma inguinale. By Robert B. Greenblatt. Granuloma inguinale: Streptomycin therapy and research. By Robert B. Greenblatt, Robert B. Dienst, Herbert S. Kupperman, and Cecil R. Reinstein. September 1947. 8 pages. 5 cents.
290. Notes on the epidemiology of granuloma inguinale. By Charles Walter Clarke. September 1947. 6 pages. 5 cents.
291. "Penicillin-resistant gonorrhea" vs. "nonspecific urethritis." By George E. Parkhurst, Fred W. Harb, and George R. Cannefax. October 1947. 4 pages. 5 cents.
292. A study of preinoculation and preincubation factors in the primary isolation of Neisseria gonorrhoeae. By J. H. Schubert, Matthew A. Bucca, and J. D. Thayer. October 1947. 4 pages. 5 cents.
293. Two reports on out-patient attendance for treatment of syphilis, using penicillin in oil-beeswax. I. A study of clinic attendance. By Charles R. Hayman. II. Attendance record of patients treated by private physicians. By R. B. Aiken. October 1947. 4 pages. 5 cents.
294. A comparison of the efficiency of three common methods of transportation of gonorrheal specimens. By Lenore R. Peizer and Gustav I. Steffen. October 1947. 4 pages. 5 cents.
295. Penicillin therapy in early syphilis: III. By R. C. Arnold, J. F. Mahoney, John C. Cutler, and Sacha Levitan. November 1947. 4 pages. 5 cents.
296. Venereal disease control during the postwar period. By J. R. Heller, Jr. November 1947. 5 pages. 5 cents.
297. Quantitative serologic tests for syphilis. I. A standard method of reporting. By Ad Harris. November 1947. 3 pages. 5 cents.
298. Attempted immunization of rabbits against syphilis with killed *Treponema pallidum* and adjuvants. By Harold J. Magnuson, Seymour P. Halbert, and Barbara J. Rosenau. December 1947. 5 pages. 5 cents.
299. Contribution of the nurse in the schools to venereal-disease control. By Jane Barbara Taylor and Mildred F. Wills. December 1947. 5 pages. 5 cents.
300. Syphilis morbidity reporting by private physicians in the State of Florida. By R. F. Sondag and A. J. Sweeney. December 1947. 4 pages. 5 cents.

Supplement to the Journal of Venereal Disease Information

21. Autopsy studies in syphilis. A monograph. By Paul D. Rosahn. 1947. 67 pages. 25 cents.

Venereal Disease Bulletin

99. Venereal-disease control. A brief presentation of the venereal-disease control plan practiced in the United States of America. March 1947. 10 pages. 5 cents.

National Office of Vital Statistics Publications

Current mortality analysis (monthly), vol. 5, Nos. 5–9, 1947.

A list of current publications of the National Office of Vital Statistics, August 1947, 6 pages.

Monthly marriage report (marriage licenses issued in major cities), new series: vol. 1, Nos. 6–11, 1947.

Monthly vital statistics bulletin, vol. 9, Nos. 5–10, 1947.

Quarterly marriage report (marriage licenses issued in the United States by State, 1947), vol. 2, Nos. 1–3.

Vital statistics—Special reports, vol. 25, national summaries:
- No. 18. Plural birth statistics United States and each State, 1944. 337 to 362 pages.
- No. 19. Index to volume 25. 363 to 370 pages.

Vital statistics—Special reports, vol. 27, national summaries:
- No. 3. Deaths and death rates for selected causes: United States, each division and State, 1945. 27 to 46 pages.
- No. 4. Infant mortality by race and by urban and rural areas: United States, each division and State, 1945. 47 to 54 pages.
- No. 5. Births and deaths by specified race: United States, each division and State, 1945. 55 to 58 pages.
- No. 6. Annual summary of motor-vehicle accident fatalities, 1945. 59 to 130 pages.
- No. 7. Maternal mortality by cause and by race: United States and each State, 1945. 131 to 146 pages.
- No. 8. Births and deaths by urban and rural areas: United States, each division and State, 1945. 147 to 152 pages.
- No. 9. Births by person in attendance, by race and by urban and rural areas: United States, each division and State, 1945. 153 to 162 pages.
- No. 10. Marriage and divorce statistics: United States, 1946. 163 to 176 pages.
- No. 11. Deaths and death rates for selected causes, by age, race, and sex: United States, 1945. 177 to 214 pages.
- No. 12. Infant mortality from selected causes, by age, race, and sex: United States, 1945. 215 to 232 pages.

Vital Statistics—Special reports, vol. 23, selected studies:
- No. 16. Is family size increasing? 317 to 326 pages.
- No. 17. Seasonal variation in the crude birth rate. 327 to 336 pages.

Vital statistics—Special reports, vol. 26, State summaries:
- Nos. 16–54. Summary of vital statistics, 1945, for each State, Kansas through Wyoming (issued in alphabetic order); and the possessions of the United States: Alaska, Hawaii, Puerto Rico, and the Virgin Islands. 201 to 674 pages.

Weekly Mortality Index, vol. 18, Nos. 26–51.

Where to write concerning marriage and divorce records. August 1947. 4 pages.

Summary of international vital statistics, 1937–1944 (1947). 299 pages. $1.25.

Uniform definitions of motor vehicle accidents, 1947. 17 pages.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED MAY 8, 1948

Summary

A total of 107 cases of poliomyelitis was reported for the current week, as compared with 56 last week and a 5-year (1943–47) median of 26, reported for the corresponding week last year. Of the current total, Texas reported 55 (last week 25), California 14 (last week 3), North Carolina 8 (last week 7), and Indiana and Iowa 4 each. The total for the 7-week period since the average date of seasonal low incidence is 321, as compared with a 5-year median of 196 (reported last year), 126 in 1944 (the lowest number reported for a corresponding period of the past 5 years) and 219 in 1945 (the highest).

The incidence of measles continued above the 5-year median. A total of 28,343 cases was reported, as compared with 28,426 last week and a 5-year median of 26,032. Of the current total, 14,279 cases, or 50 percent occurred in the Middle Atlantic and East North Central areas (last year 3,037, or 37 percent of the 8,228 cases reported for the week). The total for the year to date is 334,940, as compared with 107,221 for the same period last year and a 5-year median of 340,866.

Of the total of 9 cases of Rocky Mountain spotted fever (last week 2, 5-year median 6), Maryland reported 3, Wyoming 2, and North Carolina, Oklahoma, Colorado, and Oregon, 1 each. The total to date is 22 (the same as the 5-year median), as compared with 21 for the same period last year.

One case of smallpox was reported, in Louisiana, and 1 case of anthrax, in Pennsylvania. Of the 7 cases of leprosy reported, 5 were in Florida and 1 each in New York and California. One case of psittacosis was reported in California.

A total of 9,266 deaths from all causes was recorded during the week in 93 large cities in the United States, as compared with 9,041 last week, 9,190 and 9,144, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 9,147. The total for the year to date is 188,841, as compared with 189,114 for the corresponding period last year. Infant deaths totaled 655, as compared with 679 last week, 769 and 619, respectively, for the corresponding week of 1947 and 1946, and a 3-year median of 619. The cumulative figure is 13,072, as compared with 15,064 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended May 8, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	May 8, 1948	May 3, 1947		May 8, 1948	May 3, 1947		May 8, 1948	May 3, 1947		May 8, 1948	May 3, 1947	
NEW ENGLAND												
Maine	1	1	1	2	4	------	34	134	134	0	0	1
New Hampshire	0	0	0	------	------	------	20	4	23	0	0	0
Vermont	0	0	0	------	------	------	31	192	145	0	0	0
Massachusetts	6	9	8	------	------	------	1,369	461	952	3	1	5
Rhode Island	0	1	1	------	------	------	1	182	28	0	0	1
Connecticut	0	1	1	4	9	------	119	842	476	0	1	2
MIDDLE ATLANTIC												
New York	16	20	15	(1)	[1] 6	[1] 6	2,420	531	1,624	8	8	15
New Jersey	0	15	5	5	4	4	1,805	420	1,252	1	2	3
Pennsylvania	2	17	10	(2)	(2)	[2] 1	2,188	305	818	6	3	13
EAST NORTH CENTRAL												
Ohio	7	9	9	------	8	8	1,447	920	734	2	2	8
Indiana	20	5	4	------	4	4	1,335	111	261	0	3	3
Illinois	0	2	4	2	12	12	1,550	185	719	6	4	15
Michigan [2]	4	3	5	------	16	3	1,455	128	1,067	3	1	4
Wisconsin	1	1	1	13	24	38	2,079	437	1,854	2	1	1
WEST NORTH CENTRAL												
Minnesota	3	9	6	------	2	------	645	460	390	2	0	3
Iowa	0	1	2	------	------	------	255	127	249	0	1	1
Missouri	4	1	2	2	3	3	281	26	179	1	5	5
North Dakota	2	1	1	------	6	27	19	9	6	4	1	1
South Dakota	1	1	1	------	------	------	86	71	55	0	0	0
Nebraska	0	0	1	2	8	3	355	11	157	2	1	0
Kansas	4	4	4	1	2	------	52	13	514	0	2	2
SOUTH ATLANTIC												
Delaware	1	1	0	------	------	------	27	2	30	0	0	0
Maryland [3]	3	1	7	1	2	4	429	52	223	1	0	3
District of Columbia	0	0	0	------	------	------	132	25	77	0	0	0
Virginia	4	3	4	201	893	143	217	282	452	4	2	7
West Virginia	7	1	3	16	24	13	130	31	45	0	7	5
North Carolina	10	9	6	------	------	------	19	115	353	0	3	3
South Carolina	* 4	4	2	239	652	229	168	277	271	0	1	3
Georgia	3	0	2	3	41	2	39	107	107	1	1	1
Florida	5	4	3	3	78	3	135	60	87	1	1	3
EAST SOUTH CENTRAL												
Kentucky	5	6	2	1	6	6	228	9	153	0	4	4
Tennessee	2	5	4	18	83	26	183	104	196	1	2	4
Alabama	4	0	4	10	127	21	18	285	212	1	2	2
Mississippi [3]	3	3	3	2	45	------	25	23	------	1	0	4
WEST SOUTH CENTRAL												
Arkansas	2	2	2	106	152	21	145	72	122	1	2	2
Louisiana	2	4	4	1	9	5	8	45	84	2	3	3
Oklahoma	0	0	4	44	85	34	97	6	52	1	1	2
Texas	15	17	23	392	938	512	2,789	414	647	4	4	9
MOUNTAIN												
Montana	0	0	0	7	42	6	121	140	105	0	0	0
Idaho	0	0	0	19	21	2	143	1	58	0	0	0
Wyoming	0	1	1	1	1	------	78	15	91	0	0	0
Colorado	4	9	9	3	74	18	678	141	299	4	0	1
New Mexico	0	1	1	------	12	3	29	62	62	0	0	0
Arizona	5	0	1	28	85	42	428	61	61	0	0	0
Utah [3]	2	1	0	2	28	13	306	10	179	0	0	1
Nevada	0	0	0	------	------	------	4	------	7	0	0	0
PACIFIC												
Washington	0	0	7	------	11	------	720	47	307	1	3	3
Oregon	2	2	2	15	36	16	157	33	191	0	0	3
California	4	13	20	14	33	29	3,344	240	1,267	4	7	15
Total	158	188	190	1,157	3,586	1,432	28,343	8,228	26,032	67	79	158
18 weeks	*3,475	4,821	4,821	130,335	290,376	182,740	334,940	107,221	340,866	1,453	1,596	4,167
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	*9,833	12,387	13,549	173,893	323,351	323,351	369,886	130,108	378,879	2,235	2,568	6,619

---

[1] New York City only. [2] Philadelphia only.

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

*Correction (deducted from cumulative total): Diphtheria, South Carolina, week ended Apr. 24, 7 cases (instead of 13).

Telegraphic morbidity reports from State health officers for the week ended May 8, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943–47	Week ended		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	May 8, 1948	May 3, 1947		May 8, 1948	May 3, 1947		May 8, 1948	May 3, 1947		May 8, 1948[5]	May 3, 1947	
NEW ENGLAND												
Maine	0	0	0	17	10	18	0	0	0	0	1	0
New Hampshire	0	0	0	3	8	11	0	0	0	0	0	0
Vermont	0	0	0	1	6	9	0	0	0	0	0	0
Massachusetts	0	0	0	216	92	309	0	0	0	2	4	2
Rhode Island	0	0	0	4	9	16	0	0	0	0	0	0
Connecticut	0	2	0	20	30	62	0	0	0	1	0	1
MIDDLE ATLANTIC												
New York	1	6	2	[6] 237	355	553	0	2	0	2	5	2
New Jersey	2	0	0	52	120	153	0	0	0	0	0	0
Pennsylvania	0	0	0	330	204	436	0	0	0	5	5	5
EAST NORTH CENTRAL												
Ohio	1	1	1	223	231	320	0	0	0	4	12	4
Indiana	4	0	0	54	77	78	0	1	3	3	2	2
Illinois	2	0	0	96	99	198	0	0	0	3	17	2
Michigan [3]	0	1	0	159	114	176	0	0	0	0	3	1
Wisconsin	0	0	0	52	66	193	0	3	1	0	1	0
WEST NORTH CENTRAL												
Minnesota	1	0	0	34	44	70	0	0	0	0	1	0
Iowa	4	1	1	15	23	57	0	0	0	0	0	0
Missouri	0	0	0	[6] 30	17	53	0	0	0	1	3	1
North Dakota	0	2	0	4	4	11	0	0	0	0	0	0
South Dakota	0	0	0	2	4	13	0	0	0	0	0	0
Nebraska	0	0	0	23	22	27	0	0	0	0	1	0
Kansas	1	0	0	23	40	71	0	0	0	0	1	0
SOUTH ATLANTIC												
Delaware	0	0	0	4	4	4	0	0	0	1	0	0
Maryland [3]	0	0	0	[6] 22	41	136	0	0	0	1	0	1
District of Columbia	0	0	0	9	11	22	0	0	0	0	0	0
Virginia	0	0	0	13	20	61	0	0	0	0	0	1
West Virginia	0	0	0	[6] 22	14	25	0	0	0	1	1	1
North Carolina	8	1	1	10	20	37	0	0	0	1	0	2
South Carolina	2	0	0	1	3	3	0	0	0	4	1	1
Georgia	1	0	0	6	6	9	0	0	0	2	0	2
Florida	3	2	3	4	3	5	0	0	0	2	0	2
EAST SOUTH CENTRAL												
Kentucky	0	0	0	21	24	32	0	2	0	0	3	1
Tennessee	0	0	0	20	23	41	0	0	0	2	0	1
Alabama	3	0	0	9	9	9	0	0	0	3	1	1
Mississippi [3]	0	0	0	2	7	5	0	0	0	0	2	1
WEST SOUTH CENTRAL												
Arkansas	0	1	0	8	2	7	0	0	0	4	1	2
Louisiana	1	0	0	1	5	6	1	0	0	3	2	2
Oklahoma	1	0	0	8	4	12	0	0	0	0	0	0
Texas	*55	2	2	16	15	48	0	0	0	7	6	6
MOUNTAIN												
Montana	1	0	0	5	3	17	0	0	0	0	0	0
Idaho	1	1	0	3	3	31	0	0	0	0	0	0
Wyoming	0	0	0	1	7	12	0	0	0	0	0	0
Colorado	0	0	0	37	45	48	0	0	0	0	0	0
New Mexico	1	1	0	0	9	9	0	1	0	0	0	1
Arizona	0	0	0	4	7	13	0	0	0	0	0	0
Utah [3]	0	0	0	17	18	22	0	0	0	0	0	0
Nevada	0	0	0	0	1	1	0	0	0	0	0	0
PACIFIC												
Washington	0	0	0	42	22	37	0	0	0	0	2	0
Oregon	0	0	0	20	16	23	0	0	0	0	1	0
California	14	5	3	90	130	197	0	0	0	4	6	4
Total	107	26	26	1,990	2,047	3,859	1	9	15	56	82	54
18 weeks	669	808	616	41,020	47,007	71,761	44	111	191	855	820	1,029
Seasonal low week [4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	321	196	196	63,559	73,693	110,082	65	165	272	382	335	425

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including paratyphoid fever and salmonella infections reported separately, as follows: Massachusetts 2, Connecticut 1, New York 1, Pennsylvania 1, Indiana 1, West Virginia 1, South Carolina 1, Georgia 1, Tennessee 1, Texas 1.

[6] Including cases reported as streptococcal sore throat.

*19 of these cases were for a 4-week period.

Telegraphic morbidity reports from State health officers for the week ended May 8, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended May 8, 1948							
	Week ended—		Median 1943-47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	May 8, 1948	May 3, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	11	31	36	------	------	------	------	------	------	------	------
New Hampshire	------	3	3	------	------	------	------	------	------	------	------
Vermont	21	7	12	------	------	------	------	------	------	------	------
Massachusetts	39	104	135	------	2	------	2	------	------	------	------
Rhode Island	4	24	18	------	------	------	------	------	------	------	------
Connecticut	19	44	29	------	------	------	------	------	------	------	------
MIDDLE ATLANTIC											
New York	95	174	174	11	------	------	------	------	------	2	5
New Jersey	40	145	132	------	------	------	------	------	------	------	2
Pennsylvania	101	158	158	------	------	------	------	------	------	------	1
EAST NORTH CENTRAL											
Ohio	47	176	154	10	------	------	------	------	------	------	6
Indiana	36	42	28	1	------	------	1	------	------	------	3
Illinois	55	102	99	5	1	------	4	------	------	------	8
Michigan [3]	40	260	132	7	------	------	------	------	------	------	5
Wisconsin	96	153	85	------	------	------	------	------	------	------	12
WEST NORTH CENTRAL											
Minnesota	12	32	12	------	------	------	------	------	------	------	1
Iowa	8	24	20	------	------	------	------	------	------	------	2
Missouri	13	22	22	------	------	------	------	------	------	------	1
North Dakota	2	2	2	------	------	------	------	------	------	------	------
South Dakota	1	------	------	------	------	------	------	------	------	------	------
Nebraska	3	37	8	1	------	------	2	------	------	------	1
Kansas	84	25	36	------	1	------	------	------	------	------	9
SOUTH ATLANTIC											
Delaware	1	5	1	------	------	------	------	------	------	------	1
Maryland [3]	16	80	73	------	------	4	1	3	------	------	2
District of Columbia	5	9	9	------	------	------	------	------	------	------	------
Virginia	33	85	63	1	------	21	------	------	------	------	1
West Virginia	1	47	32	------	------	------	------	------	------	------	------
North Carolina	75	66	97	------	------	------	------	1	------	------	------
South Carolina	82	109	68	1	1	------	2	------	------	------	------
Georgia	12	27	14	1	1	------	------	------	3	------	4
Florida	14	77	42	4	------	5	------	------	------	2	1
EAST SOUTH CENTRAL											
Kentucky	4	53	39	------	------	------	------	------	------	------	------
Tennessee	26	36	33	2	------	1	------	------	2	------	1
Alabama	22	64	37	------	------	------	------	------	------	2	2
Mississippi [3]	3	6	------	2	------	------	------	------	------	------	2
WEST SOUTH CENTRAL											
Arkansas	31	45	16	3	1	------	------	------	4	------	------
Louisiana	1	9	9	3	------	------	------	------	2	1	1
Oklahoma	38	20	20	------	------	3	------	1	1	------	1
Texas	390	763	270	24	334	44	------	------	2	5	9
MOUNTAIN											
Montana	6	5	5	------	------	------	------	------	------	------	1
Idaho	5	9	9	------	------	------	------	------	------	------	------
Wyoming	------	21	6	------	------	------	------	2	1	------	2
Colorado	38	42	35	------	1	------	------	1	------	------	2
New Mexico	12	28	9	------	------	------	------	------	------	------	------
Arizona	30	34	27	------	------	30	------	------	------	------	------
Utah [3]	19	5	44	------	------	------	------	------	------	------	------
Nevada	1	------	------	------	------	------	------	------	------	------	------
PACIFIC											
Washington	36	26	28	------	------	------	------	------	------	------	1
Oregon	15	22	19	3	------	------	------	1	------	------	1
California	69	351	313	5	8	------	2	------	1	1	5
Total	1,712	3,609	2,646	84	350	108	14	9	16	13	93
Same week, 1945	3,609	------	------	46	230	117	7	3	15	26	117
Average, 1943-45	2,646	------	------	26	285	109	11	6	9	45	[7] 112
52 weeks: 1948	38,450	------	------	1,258	5,107	3,205	158	22	324	247	1,640
1947	48,000	------	------	828	5,303	3,619	121	21	570	690	1,868
Average, 1943-47	44,726	------	------	530	5,261	1,868	153	22	294	817	[7] 1,538

[3] Period ended earlier than Saturday.

[7] 3-year median 1945-47.

Anthrax: Pennsylvania 1 case. *Leprosy:* New York 1, Florida 5, California 1. *Psittacosis:* California 1 case.

Alaska, week ended May 1: Influenza 2, pneumonia 2, whooping cough 19; week ended May 8, influenza 4, pneumonia 4, whooping cough 18.

Territory of Hawaii, week ended May 8: Rabies 0, leprosy 1, measles 1, scarlet fever 1, whooping cough 14.

WEEKLY REPORTS FROM CITIES *

City reports for week ended May 1, 1948

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	------	0	3	0	0	0	0	7
New Hampshire:												
Concord	0	0	------	0	------	0	1	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	1	0	------	0	384	0	5	0	69	0	1	5
Fall River	0	0	------	0	25	0	0	0	2	0	0	5
Springfield	0	0	------	0	3	0	2	0	1	0	0	------
Worcester	0	0	------	0	27	0	2	0	5	0	0	4
Rhode Island:												
Providence	0	0	2	0	4	0	3	0	3	0	1	15
Connecticut:												
Hartford	0	0	------	0	4	0	0	0	4	0	0	------
New Haven	0	0	1	0	4	0	1	0	3	0	0	4
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	28	0	7	0	11	0	0	5
New York	6	2	1	1	1,586	2	68	1	82	0	2	29
Rochester	0	0	------	0	2	0	1	0	2	0	1	------
Syracuse	0	0	------	0	3	0	0	0	1	0	0	10
New Jersey:												
Camden	0	0	------	0	27	0	2	0	1	0	0	------
Newark	0	0	2	0	263	0	1	0	9	0	0	4
Trenton	0	0	1	0	2	0	3	0	7	0	0	------
Pennsylvania:												
Philadelphia	2	0	1	1	873	3	23	0	43	0	0	7
Pittsburgh	0	0	------	0	2	3	10	0	70	0	0	3
Reading	0	0	------	0	3	0	2	0	15	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	1	0	------	0	111	1	14	0	12	0	2	2
Cleveland	1	0	------	1	21	0	4	0	38	0	1	7
Columbus	0	0	------	0	35	1	2	0	4	0	0	2
Indiana:												
Fort Wayne	0	0	------	0	14	0	0	0	1	0	0	------
Indianapolis	0	0	------	0	164	1	9	0	11	0	0	5
South Bend	0	0	------	0	4	0	0	0	1	0	0	------
Terre Haute	0	0	------	0	------	0	2	0	1	0	0	------
Illinois:												
Chicago	1	0	------	2	690	1	25	0	37	0	2	13
Springfield	0	0	------	0	3	0	0	0	4	0	0	------
Michigan:												
Detroit	1	1	1	0	519	1	6	0	67	0	0	16
Flint	0	0	------	0	------	1	1	0	5	0	0	------
Grand Rapids	0	0	------	0	13	0	0	0	3	0	0	5
Wisconsin:												
Kenosha	0	0	------	0	84	0	0	0	1	0	0	------
Milwaukee	0	0	------	0	111	0	3	0	24	0	0	3
Racine	0	0	------	0	53	0	0	0	3	0	0	5
Superior	0	0	------	0	227	0	0	0	0	0	0	1
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	284	0	1	0	1	0	0	------
Minneapolis	1	0	------	0	49	0	5	0	9	0	0	4
St. Paul	0	0	------	0	61	2	3	0	4	0	0	10
Missouri:												
Kansas City	0	0	6	0	39	0	1	0	2	0	0	4
St. Joseph	0	0	------	0	6	1	0	0	0	0	0	5
St. Louis	2	0	------	0	203	0	6	0	7	0	0	6

* In some instances the figures include nonresident cases.

City reports for week ended May 1, 1948—Continued

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0		0	175	0	3	0	0	0	0	
Kansas:												
Topeka	0	0		0	27	0	0	0	0	0	0	1
Wichita	0	0		0	5	0	4	0	1	0	0	27
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	19	0	0	0	2	0	0	
Maryland:												
Baltimore	0	0	1	0	291	0	6	0	12	0	0	7
Cumberland	1	0		0		0	0	0	0	0	0	
Frederick	0	0		0		0	0	0	0	0	0	
District of Columbia:												
Washington	0	0		0	115	1	6	0	9	0	1	11
Virginia:												
Lynchburg	1	0		0	1	0	3	0	1	0	0	
Richmond	0	0		0	1	0	1	0	2	0	0	3
Roanoke	0	0		0		0	0	0	0	0	0	1
West Virginia:												
Charleston	0	0		0	2	0	4	0	0	0	0	
Wheeling	0	0		0	26	0	1	0	1	0	0	
North Carolina:												
Raleigh	0	0		0	1	0	0	0	0	0	0	2
Wilmington	0	0		0		0	0	0	2	0	0	7
Winston Salem	0	0		0	1	0	4	0	0	0	0	4
South Carolina:												
Charleston	0	0	13	0	2	0	1	0	1	0	0	2
Georgia:												
Brunswick	0	0		0		0	0	0	0	0	0	1
Savannah	0	0		0		0	0	0	0	0	0	1
Florida:												
Tampa	1	0		0	7	0	4	1	0	0	0	
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0		0	28	0	6	0	13	0	0	10
Nashville	0	0		0	5	0	1	0	3	0	0	
Alabama:												
Birmingham	3	0	1	1		6	1	1	1	0	0	7
Mobile	0	0		0		0	0	0	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0		0	6	0	1	0	0	0	0	
Louisiana:												
New Orleans	2	0	1	0	7	0	5	0	1	0	3	1
Shreveport	0	0		0		0	3	0	0	0	0	
Oklahoma:												
Oklahoma City	0	0	4	0	22	0	3	0	2	0	0	3
Texas:												
Dallas	2	0		0	232	0	5	0	3	0	1	3
Galveston	0	0		0		0	2	1	0	0	0	
Houston	0	0	1	0	1	0	3	1	3	0	0	
San Antonio	1	0	1	0	37	0	3	0	1	0	0	
MOUNTAIN												
Montana:												
Billings	0	0		0	2	0	1	0	0	0	0	
Great Falls	0	0		0	2	0	0	0	0	0	0	
Helena	0	0		0		0	0	0	0	0	0	
Missoula	0	0		0		1	2	0	0	0	0	1
Colorado:												
Denver	0	0	1	0	288	0	1	1	4	0	0	13
Pueblo	0	0		0	9	0	0	0	1	0	0	1
Utah:												
Salt Lake City	1	0		0	71	0	0	0	0	0	0	1

City reports for week ended May 1, 1948—Continued

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	180	2	1	0	10	0	0	2
Spokane	0	0	------	0	4	0	1	0	0	0	0	2
Tacoma	0	0	------	0	25	0	0	0	2	0	0	------
California:												
Los Angeles	1	0	3	0	331	0	7	2	19	0	2	12
Sacramento	1	0	------	0	14	0	0	0	4	0	0	7
San Francisco	4	0	------	0	221	1	8	0	10	0	0	7
Total	34	3	41	6	8,089	28	307	8	671	0	17	325
Corresponding week, 1947 [1]	68	------	143	23	2,157	------	390	------	581	0	15	764
Average 1943-47	67	------	84	[2] 19	[3] 6,400	------	[2] 337	------	1,435	1	12	669

[1] Exclusive of Oklahoma City.

[2] 3-year average, 1945–47.

[3] 5-year median, 1943–47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (latest available estimated population, 34,123,200)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Tyhpoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	2.8	0.0	8.5	0.0	1,276	0.0	48.1	0.0	246	0.0	5.7	113
Middle Atlantic	3.7	0.9	2.3	2.3	1,291	3.7	54.2	0.5	112	0.0	1.4	27
East North Central	2.4	0.6	0.6	1.8	1,246	3.6	40.1	0.0	129	0.0	3.0	36
West North Central	6.0	0.0	12.1	0.0	1,707	6.0	46.3	0.0	48	0.0	0.0	115
South Atlantic	5.4	0.0	25.3	0.0	841	1.8	54.1	1.8	54	0.0	1.8	70
East South Central	17.7	0.0	5.9	5.9	195	35.4	47.2	5.9	100	0.0	0.0	106
West South Central	12.7	0.0	17.8	0.0	775	0.0	63.5	5.1	25	0.0	10.2	18
Mountain	8.3	0.0	8.3	0.0	3,073	8.3	33.0	8.3	41	0.0	0.0	132
Pacific	9.5	0.0	4.7	0.0	1,226	4.7	26.9	3.2	71	0.0	3.2	47
Total	5.2	0.5	6.3	0.9	1,239	4.3	47.0	1.2	103	0.0	2.6	50

Dysentery, amebic.—Cases: New York 5; Detroit 1; New Orleans 4; San Antonio 1; Los Angeles 3.
Dysentery, bacillary.—Cases: Worcester 1; New York 1; Chicago 2; Charleston, S. C. 1; Birmingham 1.
Dysentery, unspecified.—Cases: San Antonio 7.

PLAGUE INFECTION IN ARIZONA, NEW MEXICO, AND WASHINGTON

Under date of May 4, 1948, plague infection was reported proved in pools of fleas from rats and mice in Arizona, New Mexico, and Washington as follows:

ARIZONA

Navajo County.—A pool of 42 fleas from 4 wood rats, *Neotoma albigula,* trapped April 15 along State Highway No. 173 about 1½ miles southeast of Pinetop.

NEW MEXICO

Lincoln County.—A pool of 20 fleas from 21 wood rats, *Neotoma albigula,* trapped April 15, 1 mile north on a ranch road from a location 3 miles east of Capitan on U. S. Highway No. 380.

WASHINGTON

Kittitas County.—A pool of 180 fleas from 70 field mice, *Microtus* sp., trapped April 14 about 6 miles southeast of Kittitas.

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—March 1948.—During the month of March 1948, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Residence [1]									
	Panama City		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	4				2		8		14	
Diphtheria	8		1		3		5		17	
Dysentery:										
Amebic	4	1			2		6		12	1
Bacillary	1				4				5	
Hepatitis, infectious					1		3		4	
Malaria [2]	3		3		3		113		122	
Measles	15		1		3		15		34	
Meningitis, meningococcus								1		1
Paratyphoid fever					1				1	
Pneumonia		11		1	14	1		3	[3] 14	16
Relapsing fever							1		1	
Streptococcal sore throat					1				1	
Tetanus							1	3	1	3
Tuberculosis		17		6	5	2		3	[3] 5	28
Typhoid fever							2	1	2	1

---

[1] If place of infection is known, cases are so listed instead of by residence.
[2] 8 recurrent cases.
[3] In the Canal Zone only.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended April 17, 1948.—During the week ended April 17, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		41	1	257	516	53	9	30	119	1,026
Diphtheria				11	2	1	1	2		17
German measles				36	21		2	8	12	79
Influenza		17			43	16			195	271
Measles		2		734	1,075	6	7	13	148	1,985
Meningitis, meningococcus					2					2
Mumps		19		373	290	73	107	49	41	952
Poliomyelitis					1		2			3
Scarlet fever		5	7	49	92		3	3	8	167
Tuberculosis (all forms)		8	13	84	30	24	9	3	47	218
Typhoid and paratyphoid fever				5			1			6
Undulant fever					2			1		3
Venereal diseases:										
Gonorrhea	3	9	9	129	67	35	7	43	80	382
Syphilis	3	9	6	97	60	14	8	5	20	222
Other forms									2	2
Whooping cough				70	29	7	2	20	12	140

NORTHERN RHODESIA

Smallpox.—Information dated May 5, 1948, states that an epidemic of smallpox has been reported in the Zambesi Valley area, 100 miles east of Livingstone, Northern Rhodesia. The number of cases has not been ascertained, but 74 deaths are reported to have occurred during the past two months.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From consular reports, international health organizations, medical officers of the Public Health Service, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

(Cases)

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place	January—February 1948	March 1948	April 1948—week ended—			
			3	10	17	24
AFRICA						
Egypt	1					
Cairo	1					
ASIA						
Burma	1	1				
India	18, 243	6, 778	1, 848	1, 268		
Ahmadabad	1	1				
Alleppey	1					
Calcutta [1]	1, 326	854	282	343	292	435
Cawnpore		14	2	1	3	1
Cocanada	2					
Colachel		12				
Cuddalore	12					
Kilakarai	7	6				
Lucknow	6	3				
Madras	7	11	10	1		
Nagpur		1	1			
Negapatam	13	3				
New Delhi						1
Tuticorin	14	2				
India (French):						
Chandernagor	12	5				
Karikal	284					
Pondicherry	26	32				
Indochina (French):						
Cambodia	611	192		[2] 76		
Cochinchina	54	117		[2] 115	[3] 81	
Chaudoc	1					
Cholon	1	2		[2] 9		
Giadinh		4				
Longxuyen		7				
Mytho	4	8		[2] 8		
Rachgia	11	73		[2] 20		
Saigon	11	12	9	24	12	12
Laos	[4] 12					
Tonkin		1				
Pakistan	5, 441	609	1, 289	1, 433		
Chittagong	5	12				
Lahore		2			6	10
Siam	24	1				
Syria	3					

---

[1] Includes imported cases.
[2] For the period Apr. 1–10, 1948.
[3] For the period Apr. 11–20, 1948.
[4] Deaths.

PLAGUE

(Cases)

Place	January—February 1948	March 1948	April 1948—week ended—			
			3	10	17	24
AFRICA						
Belgian Congo	2	1	1			
British East Africa:						
Kenya	8	7				
Tanganyika	51	138				6
Madagascar	107	45		[1] 30		
Tananarive		10		[1] 6		
Rhodesia, Northern	13	8		1		
Union of South Africa	[2] 28	[2] 7		2		
ASIA						
Burma	[3] 296	106	18	15	9	6
Mandalay	5	1				
Rangoon	[4] 10	1			[5] 1	
China:						
Chekiang Province		3				
Wenchow		3				
Fukien Province	29	20				
Kiangsi Province	8					
Kwangtung Province	9					
Yunnan Province	31					
India	8, 432	5, 314	1, 119	477		
Indochina (French):						
Annam	106	25		[1] 2		
Cochinchina	9	14		[1] 14		
Laos		2				
Java	4					
Siam	88	11	2			
EUROPE						
Portugal: Azores	7					
SOUTH AMERICA						
Argentina:						
Buenos Aires Province	5					
Ecuador	19					
Chimborazo Province	1					
Loja Province	1					
Peru:						
Huacho Department	1					
Lima Department	5					
OCEANIA						
Hawaii Territory: Plague-infected rats	5					

---

[1] For the period Apr. 1-10, 1948.
[2] Includes 2 cases of pneumonic plague.
[3] Includes 1 imported case.
[4] Includes 2 imported cases.
[5] Imported.

SMALLPOX

(Cases)

(P=present)

AFRICA						
Algeria	72	38				
Angola	54					
Basutoland	3					
Belgian Congo	[1] 387	[1] 240				
British East Africa:						
Kenya	48	17	13			
Nyasaland	861	341	47	87		
Tanganyika	154	179	22	1		
Uganda	81	16	14			
Cameroon (French)		2				
Dahomey	76	106		[2] 3	[3] 7	

See footnotes at end of table.

SMALLPOX—Continued

Place	January—February 1948	March 1948	April 1948—week ended— 3	10	17	24
AFRICA—continued						
Egypt	82	124	30	22	----	----
Eritrea	----	5	----	----	----	----
French Equatorial Africa	10	----	----	----	----	----
French Guinea	48	20	----	----	----	----
French West Africa: Haute-Volta	245	37	----	----	----	----
Gambia	15	3	----	----	2	----
Gold Coast	324	113	74	----	----	----
Ivory Coast	164	35	----	[2] 20	----	----
Libya	54	23	12	3	4	----
Mauritania	1	----	----	----	----	----
Morocco (French)	11	2	----	----	----	----
Mozambique	17	5	----	----	----	----
Nigeria	316	----	----	----	----	----
Niger Territory	147	73	----	----	----	----
Rhodesia:						
Northern	103	3	1	----	----	----
Southern	132	----	----	----	----	----
Senegal	3	----	----	----	----	----
Sierra Leone	74	9	----	----	----	----
Sudan (Anglo-Egyptian)	[1] 291	[1] 68	[1] 23	[1] 3	[1] 15	[1] 36
Sudan (French)	8	6	----	----	----	----
Swaziland	----	----	1	----	----	----
Togo (British)	9	----	----	----	----	----
Togo (French)	12	21	----	----	----	----
Tunisia	399	66	----	----	----	----
Union of South Africa	----P	3	----	----	----	----
ASIA						
Arabia	[4] 1	[4] 1	----	----	----	----
British North Borneo	1	----	----	----	----	----
Burma	682	628	148	135	104	156
Ceylon	[4] 6	[4] 3	----	----	----	----
China	1,490	677	95	115	97	69
India	15,108	7,686	1,964	1,919	----	----
India (French)	3	2	----	----	----	----
Indochina (French)	1,024	548	----	[2] 139	[3] 41	----
Iran	303	51	----	----	----	----
Iraq	174	176	49	58	33	30
Japan	6	2	----	3	----	----
Lebanon	57	----	----	----	----	----
Malay States (Federated)	264	49	6	2	----	----
Manchuria	30	----	----	----	----	----
Pakistan	4,967	839	98	----	----	----
Palestine	8	----	----	----	----	----
Siam	304	87	----	3	----	----
Straits Settlements	----	----	----	----	----	3
Syria	15	14	----	1	----	----
Trans-Jordan	----	6	----	----	----	----
EUROPE						
France	----	3	----	----	----	----
Germany	1	----	----	----	----	----
Portugal	26	25	2	3	----	----
Spain	17	----	----	----	----	----
Canary Islands	9	----	----	----	----	----
NORTH AMERICA						
Guatemala	1	----	----	----	----	----
Mexico	138	28	----	----	----	----
SOUTH AMERICA						
Bolivia	16	15	----	----	----	----
Brazil	9	1	----	----	----	----
Chile	----	3	----	----	1	----
Colombia	1,018	879	32	28	31	----
Ecuador	[1] 1,083	[1] 215	----	----	----	----
Paraguay	[1] 49	3	----	----	----	----
Peru	----	20	----	----	----	----
Venezuela	[1] 886	[1] 358	----	[1] 78	[1] 133	----

[1] Includes Alastrim.
[2] For the period Apr. 1–10, 1948.
[3] For the period Apr. 11–20, 1948.
[4] Imported.

TYPHUS FEVER*

[Cases]

Place	January—February 1948	March 1948	April 1948—week ended—			
			3	10	17	24
AFRICA						
Algeria	54	28	-------	-------	-------	-------
Basutoland	2	3	1	-------	-------	-------
Belgian Congo	43	16	-------	-------	-------	-------
British East Africa:						
Kenya [1]	17	1	2	1	-------	-------
Egypt	23	35	17	2	-------	2
Eritrea	13	2	2	-------	-------	-------
Libya	46	28	11	11	20	-------
Morocco (French)	22	21	-------	[2] 3	-------	-------
Nigeria [1]	2	-------	-------	-------	-------	-------
Senegal	[3] 1	-------	-------	-------	-------	-------
Sierra Leone	[3] 1	[3] 1	-------	-------	-------	-------
Tunisia [1]	112	118	-------	-------	-------	-------
Union of South Africa [1]	1	30	-------	-------	-------	-------
ASIA						
Burma	5	-------	-------	-------	-------	-------
China [1]	33	3	1	1	-------	-------
Indochina (French) [1]	3	3	-------	-------	-------	-------
Iran [1]	41	10	-------	3	-------	-------
Iraq	32	19	2	14	3	6
Japan	182	55	7	17	-------	-------
Manchuria	5	-------	-------	-------	-------	-------
Palestine [1]	12	-------	-------	-------	-------	-------
Phillipine Islands	[3] 1	-------	-------	-------	-------	-------
Straits Settlements [1]	1	1	-------	-------	1	-------
Syria [1]	2	11	-------	-------	2	-------
Trans-Jordan	18	1	-------	-------	7	-------
Turkey (see Turkey in Europe).						
EUROPE						
Bulgaria	91	184	33	-------	-------	-------
Czechoslovakia	2	3	1	-------	-------	-------
France	-------	-------	[2] 1	-------	-------	-------
Germany	4	-------	-------	-------	-------	-------
Great Britain: Island of Malta [3]	7	1	-------	-------	-------	-------
Greece [1]	35	12	2	3	-------	3
Hungary	22	26	2	1	1	-------
Italy [1]	9	11	-------	-------	-------	-------
Luxemburg [4]	-------	-------	-------	-------	-------	-------
Netherlands	[3] 1	-------	-------	-------	-------	-------
Poland	62	21	-------	-------	-------	-------
Rumania [1]	16,745	1,952	-------	-------	-------	-------
Spain	-------	1	-------	-------	1	-------
Turkey	117	35	15	8	11	5
Yugoslavia	107	151	-------	-------	-------	-------
NORTH AMERICA						
Costa Rica [3]	1	-------	-------	-------	-------	-------
Cuba [3]	4	6	1	-------	-------	-------
Guatemala	18	-------	-------	-------	-------	-------
Jamaica [3]	2	-------	-------	1	-------	-------
Mexico [1]	223	31	2	2	-------	-------
Panama Canal Zone	1	-------	-------	-------	-------	-------
Puerto Rico [3]	5	3	-------	-------	-------	2
SOUTH AMERICA						
Bolivia	-------	[5] 11	12	3	-------	-------
Brazil	56	6	-------	-------	7	2
Chile [1]	10	[6] 66	-------	-------	-------	-------
Colombia	561	264	-------	-------	-------	-------
Curaçao [3]	8	3	-------	-------	-------	-------
Ecuador [1]	92	17	-------	-------	[7] 7	-------
Venezuela	13	2	-------	4	-------	-------
OCEANIA						
Australia [3]	26	17	5	3	3	-------

*Reports from some areas are probably murine type, while others probably include both murine and louse-borne types.

[1] Includes murine type. [2] For the period Apr. 1-10, 1948. [3] Murine type.

[4] The previous report of cases of typhus fever in Luxemburg was an error. The cases were later stated to have been typhoid fever.

[5] Deaths. [6] For the period Jan. 1-Mar. 15, 1948. [7] For the period Apr. 1-15, 1948.

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January—February 1948	March 1948	April 1948—week ended—			
				3	10	17	24
AFRICA							
Ivory Coast:							
Gagnao	C		1				
Nigeria: Lagos Island[1]							
SOUTH AMERICA							
Colombia:							
Antioquia Department	C	[2]5					
Boyaca Department	D	1					
Caldas Department	D	2					
Cundinamarca Department	D	7					
Intendencia of Meta	D	3					

---

[1] The case of yellow fever in Igbo Village, Lagos Island, Nigeria, reported on p. 592 of the Public Health Reports for Apr. 30, 1948, in the column for week ended March 6, has since been reported not confirmed.

[2] Includes deaths used as cases.

DEATHS DURING WEEK ENDED MAY 1, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended May 1, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	9,041	8,977
Median for 3 prior years	8,974	
Total deaths, first 18 weeks of year	179,575	179,924
Deaths under 1 year of age	679	747
Median for 3 prior years	645	
Deaths under 1 year of age, first 18 weeks of year	12,417	14,295
Data from industrial insurance companies:		
Policies in force	71,068,300	67,286,612
Number of death claims	12,406	13,724
Death claims per 1,000 policies in force, annual rate	9.1	10.6
Death claims per 1,000 policies, first 18 weeks of year, annual rate	10.2	10.0

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948

For sale by the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C.

Price 10 cents. Subscription price $4.00 a year

Public Health Reports

VOLUME 63 JUNE 4, 1948 NUMBER 23

TUBERCULOSIS CONTROL ISSUE NO. 28

IN THIS ISSUE

Editorial—Nation's Capital Surveyed
Effect of pH on Yeastlike Phase of *H. capsulatum*
Commercial X-ray Intensifying Screens—III
Tuberculosis Mortality and Morbidity Data
Copying X-ray Films

1798

FEDERAL SECURITY AGENCY

PUBLIC HEALTH SERVICE

FEDERAL SECURITY AGENCY

Oscar R. Ewing, Administrator

PUBLIC HEALTH SERVICE

Leonard A. Scheele, Surgeon General

Division of Public Health Methods

G. St. J. Perrott, Chief of Division

CONTENTS

Page
Editorial—The Nation's Capital surveyed. Francis J. Weber 737
Effect of hydrogen-ion concentration on yeastlike phase of *Histoplasma capsulatum* (Darling). Forrest W. Cross 739
Characteristics of commercial X-ray intensifying screens and films—III. Willard W. Van Allen 746
Where to find tuberculosis mortality and morbidity data. Eleanor Hanna and Stanley Glaser 748
Copying X-ray films. David M. Gould, Willard W. Van Allen and Charles M. Bailey 763
Death rates for tuberculosis (all forms) by race 766

INCIDENCE OF DISEASE

United States:

Reports from States for week ended May 15, 1948, and comparison with former years 767

Weekly reports from cities:

City reports for week ended May 8, 1948 771
Rates, by geographic divisions, for a group of selected cities 773
Plague infection in Arizona and Washington 773

Foreign reports:

Canada—Provinces—Communicable diseases—Week ended April 24, 1948 774
Finland—Notifiable diseases—March 1948 774
Madagascar—Notifiable diseases—March 1948 775
Norway—Notifiable diseases—January 1948 775
Straits Settlements—Singapore—Poliomyelitis 775
Venezuela—Maracaibo—Poliomyelitis 776

Reports of cholera, plague, smapllox, typhus fever, and yellow fever received during the current week—

Plague 776
Smallpox 776
Deaths during week ended May 8, 1948 776

Public Health Reports

Vol. 63 • *JUNE 4, 1948* • *No. 23* *

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

EDITORIAL—THE NATION'S CAPITAL SURVEYED

This month, the largest and most ambitious tuberculosis case-finding effort in history will draw to a close in Washington, D. C., where for the first time a city of nearly 1,000,000 population will have been screened for tuberculosis by the technique of the community-wide survey. In operation, the survey of the Nation's capital has followed the successful pattern developed in several cities where similar enterprises have previously been completed. As in the case of these previous surveys, the touchstone of success has been community participation and organization. Responsibility for the technical aspects of the survey was discharged by the cooperative efforts of the official health agency, the local voluntary association, and the local medical profession. The difficult task of bringing the population before the penetrating eye of the photofluorograph was accomplished through the efforts of citizens' committees directed by leaders in every field of civic enterprise.

Although such case-finding programs have come to be known popularly as mass X-ray surveys, they are in reality deserving of a more meaningful term, for they actually extend far beyond the activity of case finding alone. They are, indeed, well-organized efforts on the part of all groups in a community to bring to bear upon the tuberculosis problem the weight of all known techniques and all existing facilities. Therefore, the photofluorographic examination of all adults in a community is but one result of such programs. More important yet, the fusion of all groups within the community in the common effort to find tuberculosis brings with it further benefits which make possible for the future a more effective tuberculosis control program. Moreover, in providing the opportunity for a community to evaluate precisely the extent of its tuberculosis problem, the community-wide survey concurrently stimulates the mobilization of community resources to deal effectively with that problem. Thus, the mass case-finding technique, in serving as a measure of the need for community action to control tuberculosis, invariably points the way to the institution of long-range control measures which will certainly bear fruit far beyond the envisioned objectives of the original case-finding undertaking.

---

*This is the twenty-eighth of a series of special issues of PUBLIC HEALTH REPORTS devoted exclusively to tuberculosis control, which will appear the first week of each month. The series began with the Mar. 1, 1946 issue. The articles in these special issues are reprinted as extracts from the PUBLIC HEALTH REPORTS. Effective with the July 5, 1946 issue, these extracts may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 10 cents a single copy. Subscriptions are obtainable at $1.00 per year; $1.25 foreign.

The ease and economy of the mass radiographic technique make it eminently possible for localities to conduct mass surveys within a brief period of time, without disruption of the normal work of the various agencies concerned. Moreover, it has been demonstrated that high standards of performance, especially in the follow-up of newly discovered cases, can be maintained in the course of these programs, and can be expected to persist long after their completion. As further experience is gained in this community activity, it can be expected that methods will be improved and higher standards of performance attained in the daily application of control principles.

Experience indicates that the resources basic to the prosecution of these local programs are inherent in the individual community's organizations, agencies, and institutions. Indeed, in one area after another where surveys have already been completed, not only has the community found the resources necessary for case finding, but it has proceeded to find and furnish the tools for long-range tuberculosis-control activities following the completion of the case-finding program. Given a high level of popular interest stimulated through local leadership, and given appropriate community participation and mobilization, such as that employed within the District of Columbia and elsewhere, more and more localities can achieve equal success in the acceleration and intensification of their tuberculosis-control programs.

The medium of mass radiography based on community action now makes it possible to envision the examination of the entire adult population of the United States within a very few years. Success in this phase of the national program will spell material progress toward the effective goal of ultimate tuberculosis control within the national community.

FRANCIS J. WEBER, *Medical Director,*
Chief, Tuberculosis Control Division.

THE EFFECT OF HYDROGEN-ION CONCENTRATION ON THE YEASTLIKE PHASE OF *HISTOPLASMA CAPSULATUM* (DARLING)[1]

By FORREST W. CROSS, *Assistant Sanitarian (R) Public Health Service*

The effect of hydrogen-ion concentration on the saprophytic phase of *Histoplasma capsulatum* has been studied and reported by Howell (*1*) who employed a modification of Mosher's synthetic medium with a pH range from 3.5 through 8.6. He found that the hydrogen-ion concentration affects the growth and sporulation of *H. capsulatum* and that the optimum hydrogen-ion concentration may vary with the medium used. Moore (*2*), in his study on Posadasia capsulata (*H. capsulatum*), observed the growth of the mycelial phase on various media, each of which had a fixed hydrogen-ion concentration. The hydrogen-ion of the media he used varied from 4.1–7.5, but each medium was employed at only one hydrogen-ion concentration and the optimum range for each medium was not determined.

The effect of hydrogen-ion concentration on the yeastlike phase of *H. capsulatum* was first reported by DeMonbreun (*3*) who found that the hydrogen-ion concentration of the medium employed influences both the character and amount of growth obtained. In a medium rich in protein or organic nitrogen compounds, considerable proliferation of the yeastlike form, as well as the development of the mycelial form, was observed in cultures in infusion broth (pH 7.2) maintained at 37° C. There was little tendency for the mycelium to develop when this medium, adjusted to pH 8.4, was inoculated with the yeastlike organisms; and the yeastlike organisms persisted for a comparatively long time but showed only slight tendency to multiply.

Reid, Scherer, Herbut, and Irving (*4*) reported growth of the yeastlike phase of *H. capsulatum* in a veal infusion medium adjusted to pH 7.4.

Parsons and Zarafonetis (*5*) have reported that the yeastlike form of *H. capsulatum* as obtained directly from tissue or blood can be grown at 37° C. on blood agar or other neutral or slightly basic media which have a high content of protein.

Other investigators have reported that the yeastlike form persists on blood or serum media at 37° C., when sealed and transferred at short intervals (*3, 6, 7, 9*).

Salvin (*7*) reported growth of a yeastlike phase in a fluid medium, designated as "Y. P." medium, containing a mixture of organic nitrogen compounds, with best growth occurring at hydrogen-ion concentrations between 6.3–8.1 at a temperature near 37° C. However, he stated that no growth appeared in this medium unless a small percentage of agar, silica gel or sôme similarly functioning substance was added.

---

[1] From the Office of Field Studies, Tuberculosis Control Division.

The present study was undertaken because it had been observed that it is difficult to maintain the micro-organisms persistently in the smooth yeastlike phase on blood agar. The effects of the hydrogen-ion concentration with relation to the medium employed were studied in an attempt to ascertain the optimum hydrogen-ion range for the propagation of the yeastlike form of *H. capsulatum*.

MATERIALS AND METHODS

Five strains of *H. capsulatum* were used in this experiment. These were obtained from Dr. Arden Howell, Jr., Mycologist, Office of Field Studies, Tuberculosis Control Division, Public Health Service. Three of these strains were isolated from cases reported by Rhodes, Conant and Glesne (*8*), Reid, Scherer, Herbut and Irving (*4*) and DeMonbreun (*9*). One strain was isolated by Dr. J. C. Peterson, Vanderbilt University Medical School, from a fatal case in 1945.[2] The fifth strain was isolated from a case in South Africa in 1945.[3] In this report these strains were designated as strains C–650, C–651, C–701, P–4 and C–984, respectively.

Three media were employed:

1. Sabouraud's dextrose broth modified by use of only 1 percent dextrose. The dextrose was sterilized by Seitz filtration and added to the sterile peptone solution.
2. Brain Heart Infusion Broth "Difco" lot No. 380365.
3. Beef extract broth modified as follows: Beef extract, 6 grams; NaCl, 5.0 grams; Bacto-peptone, 10 grams; distilled water, 1,000 cc. Sterilization by autoclaving.

The various hydrogen-ion concentrations used with each medium were adjusted by means of sodium phosphate buffers. The final initial concentrations used were as follows: Sabouraud's broth—6.8, 6.9, 7.1, 7.25, 7.4, 7.55, 7.7, 7.8, 8.1, and 8.85; Brain Heart Infusion—6.80, 7.15, 7.25, 7.3, 7.4, 7.5, 7.6, 7.8, and 8.0; beef extract broth—6.7, 6.8, 7.0, 7.1, 7.3, 7.5, 7.8, 7.9, and 8.45.

A 1:100 saline suspension prepared from 6-day-old cultures[4] of the yeastlike phase of each strain was used as the inoculum. Each tube containing 10 ml. of each medium was inoculated with five-tenths of a cubic centimeter of this suspension. The actual volume of packed cells constituting each inoculum was determined by centrifugation in Hopkin tubes at 2,000 r. p. m. for 30 minutes. Five tubes of each medium at each hydrogen-ion concentration were employed.

Immediately following inoculation, three tubes of each medium were placed in the incubator at 37° C. The remaining two tubes of each medium were left at room temperature, 25° C. At the end of 5 days of incubation the amount of growth in each tube at 37° C was estimated by centrifugation in Hopkin tubes at 2,000 r. p. m. for 30 minutes. The packed volume of each tube was recorded and the average volume of the three tubes determined.

---

[2] Personal communication.

[3] Obtained from Dr. N. F. Conant, Duke Medical School.

[4] Grown on agar containing 10 percent horse blood.

Immediately after centrifugation wet mounts were prepared for microscopic examination from the sediment of each tube at each hydrogen-ion concentration. These mounts were prepared with Linder's mounting fluid (*10*).

RESULTS

CULTURES AT 25° C.

The cultures of all strains at room temperature (25° C) showed conversion from the yeastlike phase and the resultant growth was mycelial in character.

CULTURES AT 37° C.

Sabouraud's broth.—All cultures of all strains in this medium showed macroscopic growth of the mycelial phase of *H. capsulatum* which varied from small submerged floccose masses to scattered pin point surface colonies of white aerial mycelium. Since this growth was not suitable for measurement in Hopkin tubes, the amount of growth was estimated macroscopically and recorded in table 1.

TABLE 1.—*Growth of* Histoplasma capsulatum *in Sabourand's broth at various hydrogen-ion concentrations after 5 days incubation at 37° C.*

pH	C-984	C-650	C-701	C-651	P4
6.8	+++	+++	+++	++++	+++
6.9	++	++	+++	+++	+++
7.1	+++	+++	+	+++	±
7.25	++++	+++	+	+	±
7.4	++	+++	+	+++	+++
7.55	±	++	+++	++	++
7.7	+++	++	+++	++	++
7.8	+++	+++	++	+++	+
8.1	++	++	+	+	±
8.85	−	−	−	−	−

− No growth.
± Few small submerged floccose colonies.
+ Many small submerged floccose colonies, occasional small surface colonies.
++ Many small and few large submerged floccose colonies, occasional small surface colony.
+++ Many mixed small and large submerged floccose colonies, occasional surface colony.
++++ Same as +++ with occasional large surface colony (coalesced small colonies).

As can be seen from table 1 the amount of growth of *H. capsulatum* in Sabouraud's broth at 37° C. varied with the strain and hydrogen-ion concentration used.

Strain C–984 showed maximum growth occurring at pH 7.25 with the minimum at 7.55. Strain C–650 showed maximum growth occurring at pH range of 6.8 through 7.4 with minimum growth at pH range of 7.55 through 8.1. Strain C–701 showed maximum growth at pH 6.8 to 6.9 and 7.55 to 7.8, with minimum growth at 7.1

through 7.4 and 8.1 or above. Strain C–651 gave maximum growth at pH range 6.8 through 7.1 with a secondary maximum at pH range 7.4 to 7 8 and minimum growth at pH range 7.25 and 8.1 or above. Strain P4 gave maximum growth at pH 6.8 through 6.9 with a slight secondary rise at 7.4 through 7.7, with minimum at pH range 7.1 to 7.25 and 8.1. Microscopic examination of cultures from all tubes exhibiting growth showed a mixture of yeastlike cells and young mycelial forms, the amount of yeastlike cells varying inversely with the amount of mycelium produced. The submerged masses of mycelium showed varying numbers of smooth-walled chlamydospores. The surface colonies showed masses of hyphae with an occasional characteristic tuberculate chlamydospore.

After examination of these cultures at the end of 5 days, the cultures of all strains at pH 8.85 were reincubated for 2 weeks at which time they were reexamined. At this time there was no additional change from the observation recorded at 5 days. Samples of the sediment were then streaked on potato dextrose agar and Sabouraud's agar and incubated at room temperature for 4 additional weeks. No growth was apparent on any of these cultures. Therefore, it would seem that the organisms after exposure to Sabouraud's broth at pH 8.85 for 19 days were no longer visible.

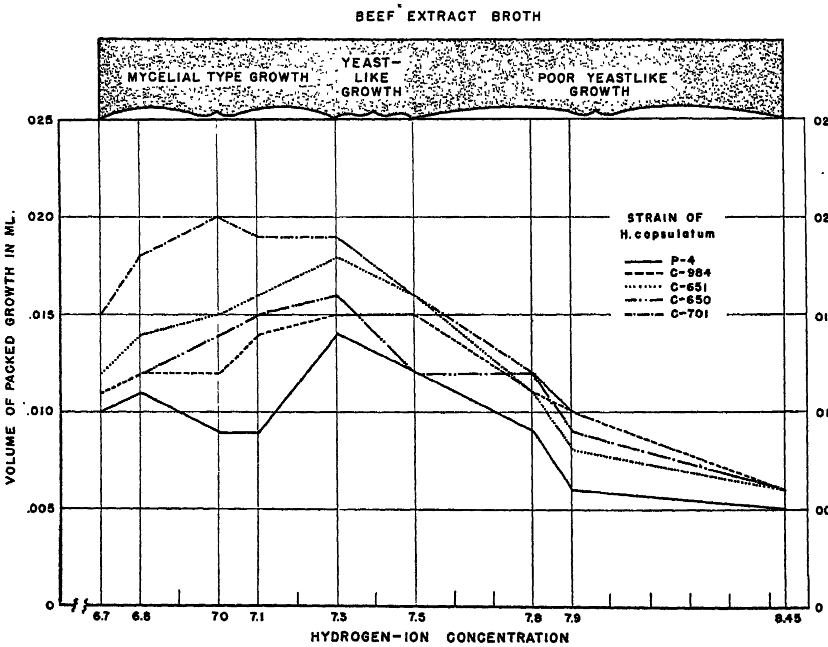


FIGURE 1

Curves showing the effect of various hydrogen-ion concentrations in beef extract broth on five strains of the yeastlike phase of *Histoplasma capsulatum* incubated for 5 days at 37° C.
Volume of growth obtained by centrifugation of cultures in Hopkin tubes at 2,000 r. p. m. for 30 minutes.
Initial volume of inoculum 0.005 ml. yeastlike cells.

Beef extract broth.—Examination of the growth in this medium, (figure 1) showed that the maximum growth for all strains except C–701 occurred at pH 7.3. In the latter strain the optimum appeared to be pH 7.0. Microscopic examination of the growth showed that the greatest production of yeastlike cells in all strains occurred between the pH range of 7.3 to 7.5. The variation of volume in pH range 6.7 through 7.1 was due to the conversion of yeastlike cells to the mycelial phase with a more marked production of mycelium at pH 6.7 through 7.0 except for strain P–4. This strain showed the greatest amount of conversion to the mycelial phase at pH 6.8 with a strong tendency to predominance of yeastlike growth at 7.0 and 7.1. The maximum production of smooth-budding yeastlike cells, however, occurred at pH 7.3. All strains except strain C–984 showed some tendency to convert to the mycelial phase in the range 7.5 to 7.9. The growth of strain C–984 at pH 7.5 was similar in character to that obtained at pH 7.3. All strains at pH 7.9 showed a predominance of yeastlike cells, smooth and intermediate, with occasional short fragments of

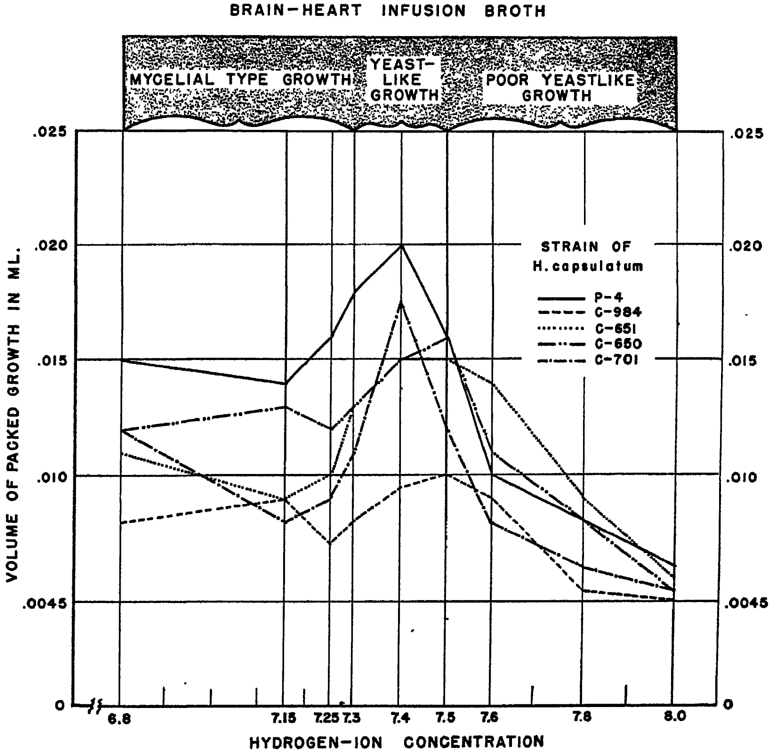


FIGURE 2

Curves showing the effect of various hydrogen-ion concentrations in Brain Heart Infusion Broth (Difco) on five strains of the yeastlike phase of *Histoplasma capsulatum* incubated for 5 days at 37° C. Volume of growth obtained by centrifugation of cultures in Hopkin tubes at 2,000 r. p. m. for 30 minutes. Initial volume of inoculum 0.0045 ml. yeastlike cells.

hyphae. The strains at pH 8.45 showed a similar type of growth with rare short fragments of hyphae.

Brain Heart Infusion Broth.—The maximum growth for all strains in this medium occurred in the pH range 7.3 through 7.5 (figure 2). Microscopic examination of this growth showed predominantly yeastlike cells. Strains C–701 and P–4 produced the most yeastlike growth at pH 7.4, while strains C–984 and C–650 produced their best yeastlike growth at pH 7.5. Strain C–651 showed an equal amount of yeastlike type production at pH 7.4 and 7.5.

The conversion of yeastlike cells to the mycelial phase was greatest in this medium at pH 6.8 diminishing in mycelial characteristics at pH 7.15 in all strains. With the exceptions of C–984 and C–650, all strains showed increased production of yeastlike cells at pH 7.25.

From pH 7.5 to 7.8, strains C–701 and P–4 showed a tendency of the yeastlike cells to convert to mycelium. Strains C–651, C–650, and C–984 showed this tendency beginning at pH 7.6.

Yeastlike cells predominated at pH 8.0 for all strains with a very slight tendency towards conversion, although the amount of growth was limited.

DISCUSSION

From the data presented in table 1, it would appear that the nutritional constituents of Sabouraud's broth are not suitable for propagation of the yeast-phase of *H. capsulatum* at hydrogen-ion concentrations ranging from 6.8 to 8.85 at 37° C. This may be due to the complexity of the nutritional requirement of the yeast-phase. While conversion to and growth of the mycelial phase occurred in all strains at hydrogen-ion concentration varying from 6.8 to 8.1, a pH of 8.85 inhibited growth after 19 days at 37° C.

Beef extract broth, although permitting multiplication of the yeastlike forms in the pH range 7.3 to 7.5, did not have a definite range in which consistently smooth-budding yeastlike cells were produced. The lack of dextrose in this medium rendered it poor in carbohydrates and may have influenced the lack of good yeastlike production. The high concentration of sodium chloride may also have influenced the lack of good yeastlike production. Since the protein complex in this medium was high, it may have been responsible for the limited production of yeastlike forms observed. It would appear that a further and more complex medium is necessary for good propagation of the yeastlike form of *H. capsulatum.*

Brain Heart Infusion supported growth of the yeast phases more consistently than the other two media employed. In this medium there was little tendency toward conversion to the mycelial phase at 7.4–7.5. In using this medium a careful check of the initial hydrogen-ion concentration is necessary. Slight variations from the pH range

7.4–7.5 will seriously effect the growth of the yeast phase of *H. capsulatum*. Variations of hydrogen-ion concentration from the optimum of 7.4–7.5 may produce a rough variety of yeastlike forms, retard growth of the yeastlike forms, or induce conversion to the mycelial phase.

From a practical standpoint this medium more than any other liquid medium tested, meets the requirements for the propagation of the yeastlike phase.

In the media employed, except Sabouraud's, when the hydrogen-ion concentration range was 6.7 through 6.8, conversion from the yeast phase to the mycelial phase as well as growth of the mycelial phase occurred, whereas when the hydrogen-ion concentration range was 7.6 through 8.45, there appeared to be only a slight tendency toward conversion to the mycelial phase and very limited growth of the yeastlike organisms.

In Sabouraud's medium, conversion to and growth of the mycelial phase occurred over a wide range of hydrogen-ion concentrations with no production of yeastlike forms. Although yeastlike production was observed with the other media employed, an optimum pH range was found necessary for good growth. Yeastlike production, however, seems to depend as much on the components of the media as the pH. The recent work of Salvin (7) indicates that with a medium of organic nitrogen compounds, the viscosity of the medium is an important factor in the production of the yeastlike phase, and that the viscosity influences the range of hydrogen-ion concentration in which good yeastlike production can be obtained.

SUMMARY AND CONCLUSIONS

1. The effect of various hydrogen-ion concentrations on the yeastlike phase of five strains of *Histoplasma capsulatum*, in modified Sabouraud's broth, modified beef extract broth and Brain Heart Infusion Broth (Difco) has been studied.

2. It is shown that, depending on the medium employed, the optimal initial hydrogen-ion concentration for the growth of the yeastlike phase of *H. capsulatum* was between pH 7.2–7.6 when the cultures were incubated at 37° C. for 5 days.

3. Of the media employed, Brain Heart Infusion Broth (Difco) provided the optimal conditions for growth of the yeastlike phase of *H. capsulatum* at pH 7.4–7.5 at 37° C.

4. The modified Sabouraud's broth employed appeared to be unsatisfactory for the propagation of the yeastlike phase of *H. capsulatum*.

5. In all media employed at 37° C., except Sabouraud's, the growth and conversion of the yeastlike phase of *H. capsulatum* decreased as the hydrogen-ion concentration is decreased above the optimal

range determined. Hydrogen-ion concentration above the optimal range determined permits conversion to and growth of the mycelial phase.

6. The hydrogen-ion concentration of a culture medium, although closely related to nutritional requirements and physio-chemical factors plays an important part in the metabolism and growth of the fungi.

ACKNOWLEDGMENT

The author desires to express his appreciation to Dr. Arden Howell, Jr., Senior Mycologist, and Michael L. Furcolow, Surgeon, Tuberculosis Control Division, Public Health Service, for their assistance in this study.

REFERENCES

(*1*) Howell, Arden, Jr.: Studies on *Histoplasma capsulatum* and similar form species. III. Effect of hydrogen-ion concentration. Mycologia. **33:** 103 (1941).
(*2*) Moore, Morris: Morphological and physiological study of two species of Posadosia. P. capsulata (Darling) Moore and P. pyriformis Moore. Ann. Mo. Bot. Gard. **22:** 335 (1935).
(*3*) DeMonbreun, W. A.: The cultivation and cultural characteristics of Darling's *Histoplasma capsulatum.* Am. J. Trop. Med. **14:** 93 (1934).
(*4*) Reid, J. D., Scherer, J. H., Herbut, P. A., and Irving H.: Systemic histoplasmosis diagnosed before death and produced experimentally in guinea pigs. J. Lab. & Clin. Med. **27:** 419 (1942).
(*5*) Parsons, Robert S., Zarafonetis, C. S. D.: Histoplasmosis in man. Report of seven cases and a review of seventy-one cases. Arch. Internal Med. **75:** 1–23 (1945).
(*6*) Conant, N. F.: A cultural study of the life-cycle of *Histoplasma capsulatum,* Darling 1906. J. Bact. **41:** 563 (1941).
(*7*) Salvin, S. B.: Cultural studies on the yeastlike phase of *Histoplasma capsulatum,* Darling. J. Bact. **54:** 655 (1947).
(*8*) Rhodes, P. H., Conant, N. F., Glesne, L. R. B.: Histoplasmosis: Report of a case in three months' old infant. J. Pediat. **18:** 235 (1941).
(*9*) DeMonbreun, W. A.: The dog as a natural host for *Histoplasma capsulatum.* Report of a case of histoplasmosis in this animal. Am. J. Trop. Med. **19:** 565 (1939).
(*10*) Linder, D. H.: An ideal mounting medium for mycologists. Science. **70:** 430 (1929).

CHARACTERISTICS OF COMMERCIAL X-RAY INTENSIFYING SCREENS AND FILMS—III [1] [2]

By Willard W. Van Allen, *Physicist, Public Health Service*

Resolving power constitutes a measure of the ability of X-ray films and screens to record detail and is measured by radiographing on the film or screen under standard conditions a graduated series of linear patterns. It is expressed as the maximum number of lines per millimeter that can be distinguished on the processed film. The resolving power of radiographic screens is considerably less than that of films, and therefore measurements of film-screen combinations are essentially the resolving power of the screens alone. Screens with the highest resolving power are capable of recording the greatest detail (table 1).

---

[1] From the Rockville Laboratory, Tuberculosis Control Division.

[2] For previous reports in the series see Public Health Reports, March 1, 1946, and September 6, 1946. The information contained in these reports is revised and augmented from time to time.

TABLE 1.—*Resolving power of commercial screens*

Manufacturer	Type	Resolving power	Use
Buck	Xtra speed	10	Intensification.
	Midspeed	10	Do.
	Definition	10	Do.
Eastman	Ultra speed	10	Do.
	Fine grain	10	Do.
	Definition	10	Do.
Patterson	Parspeed	10	Do.
	Detail	15	Do.
U. S. Radium	666D double	6	Do.
Patterson	D regular	[1]7	Fluorographic and photofluorographic.
	D cleanable	[1]7	Do.
	B	[1]5	Do.
	E2	[1]5	Do.
U. S. Radium	666D single	[1]8	Do.

[1] These figures are for screens alone. When used in photofluorography, the additional effect of the lens must be taken into consideration.

The exposure necessary to produce a given amount of film blackening depends upon the type of screen and film used and also upon the conditions of development including time, temperature, age and type of developer. If the development conditions are held constant, therefore, the speed of a film-screen combination may be determined by measuring the exposure required to produce a given density on the film. For convenience, the speed is defined as the reciprocal of the exposure in deciroentgens required to produce a density of 1.0.

The following table gives the speed, determined as above, for the film-screen combinations noted. This table will be revised and en-

TABLE 2.—*Relative speed of commercial screens*

Manufacturer	Type	Speed	Film	Development
Buck	Xtra speed	80	Eastman blue brand	4½ minutes at 68° F. in Eastman X-ray developer.
	Midspeed	70	do	Do.
	Definition	55	do	Do.
Eastman	Ultraspeed	125	do	Do.
	Fine grain	100	do	Do.
	Definition	70	do	Do.
Patterson	Parspeed	75	do	Do.
	Detail	25	do	Do.
U. S. Radium	666D double	225	do	Do.
Patterson	D regular	125	Eastman blue photoflure	6 minutes at 68° F. in Eastman X-ray developer.
	D cleanable	100	do	Do.
	B regular	70	Eastman green photoflure	Do.
	E2	80	do	Do.
U. S. Radium	666D single	75	Eastman blue photoflure	Do.

larged from time to time to include other film-screen combinations of interest, as well as data on different developers. These results will appear on these pages in subsequent issues.

The following table gives the average speed for five different developers of several types of X-ray film in combination with the screen noted.

TABLE 3.—*Relative speed of commercial films*

Film	Speed	Screen
Ansco high speed	60	Patterson parspeed.
Buck	30	Do.
Dupont 508	75	Do.
Eastman blue brand	80	Do.
Ansco fluorapid [1]	140	Patterson D.
Eastman blue photoflure	125	Do.
Eastman green photoflure	75	Patterson B.

[1] This figure is based on tests made on a pre-production sample. This film is now reported on the market.

WHERE TO FIND . . .

Tuberculosis Mortality and Morbidity Data [1]

By ELEANOR HANNA, *Statistician*, and STANLEY GLASER, *Statistician*, *Public Health Service*

For the year 1945, basic data relating to tuberculosis mortality and morbidity may be obtained from 12 sources which have been released by 2 Federal offices. The accompanying bibliography has been prepared to identify and describe these references. Although the bibliography is intended principally to serve the needs of tuberculosis workers, the National Office of Vital Statistics references, which include data on all causes of death, will be generally useful to all public health workers.

The column, "Where You Will Find It," gives the specific reference and a brief description of its general contents. The column, "What You Will Find" presents a detailed description of all tabulations which relate to tuberculosis.

Because of the tremendous task involved in the compilation, analysis, and publication of vital statistics, 1945 is the most recent year for which complete published data are available from Federal sources. More recent information for individual States may be obtained from State registrars. However, such information may not be comparable from State to State because of variations in the selection of categories and classifications.

The data contained in the references below are the only available statistics which are comparable on a National and State-to-State basis.

---

[1] From the Office of the Chief, Tuberculosis Control Division.

WHERE YOU WILL FIND IT	WHAT YOU WILL FIND
I. *Vital Statistics of the United States, 1945, Part I—by Place of Occurrence,* National Office of Vital Statistics, Public Health Service, Federal Security Agency. (The number of deaths and the death rates from tuberculosis by age, race, and sex for the United States, its States and some of its territories and possessions.)	(a) Death rates, tuberculosis (respiratory, other forms), Death Registration States, 1900–45. (b) Death rates, tuberculosis (all forms), by age (5-year intervals up to 75 and under 1 year), United States, 1945. (c) Infant mortality rates, tuberculosis (all forms, respiratory, meninges, other forms), United States, 1941–45. (d) Death rates, and number of deaths, tuberculosis (each form), United States, 1944, 1945. (e) Number of deaths, tuberculosis (each form), by race (white, Negro, Indian, Chinese, Japanese, all other) and sex, United States, 1945. (f) Number of deaths, tuberculosis (each form), by age (under 1 year, by 1-year intervals up to 5 years, by 5-year intervals up to 100 years), race (white, Negro, other), and sex, United States, 1945. (g) Number of deaths from tuberculosis (all forms), for each major geographic division (New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, Pacific) and for each State, 1945. (h) Number of deaths, tuberculosis (all forms, respiratory, other forms), not in institutions and number of deaths in institutions by type of institution (general hospital, tuberculosis hospital, mental institution, etc.) and by type of control (Federal, State, nonprofit, etc.), United States, 1945. (i) Hawaii— (1) Number of deaths, tuberculosis (all forms, respiratory, other forms), Territory of Hawaii and its subdivisions, 1945. (2) Number of deaths, tuberculosis (each form), by race (Hawaiian, Part-Hawaiian, Puerto Rican, Caucasian, Chinese, Japanese, Korean, Filipino, all other), 1945. (3) Number of deaths, tuberculosis (all forms, respiratory, other forms), by age (1-year intervals up to 5, and 5-year intervals up to 100), 1945. (4) Number of deaths, tuberculosis (all forms, respiratory, other forms), by month, 1945.

- (5) Number of deaths, infants (under 1 day, by days under 1 month, by months under 1 year), tuberculosis (all forms, respiratory, meninges), 1945.
- (6) Infant mortality rates, tuberculosis (respiratory, meninges, other forms), 1934–45.

(j) Puerto Rico—
- (1) Number of deaths, tuberculosis (all forms, respiratory, other forms), by race (white, nonwhite), sex and place (rural, urban places over 10,000, urban places between 2,500 and 10,000, and each urban place of 10,000 or more), 1945.
- (2) Similar to (i, 3) by race (white, nonwhite).
- (3) Number of deaths, tuberculosis (each form), by race (white, nonwhite), 1945.
- (4) Number of deaths, tuberculosis (all forms, respiratory, other forms), by race (white, nonwhite) and month, 1945.
- (5) Number of deaths, infants (under 1 day, by days under 1 month, by months under 1 year), tuberculosis (all forms, respiratory, meninges, other forms), 1945.
- (6) Infant mortality rates, tuberculosis (all forms, respiratory, meninges, other forms) 1944 and 1945.

(k) Virgin Islands—
- (1) Number of deaths, tuberculosis (all forms, respiratory, other forms), by race (white, Negro, other), each Island, 1945.
- (2) Number of deaths, tuberculosis (each form) by race (white, Negro, other), 1945.
- (3) Number of deaths, tuberculosis (all forms, respiratory, other forms) by ages (by 1-year intervals up to 5, 5-year intervals up to 100), 1945.
- (4) Number of deaths, tuberculosis (all forms, respiratory, other forms) by month, 1945.
- (5) Infant mortality rates, tuberculosis (respiratory), 1926–45.

(l) Alaska
- (1) Number of deaths, tuberculosis (each form) by race (white, Indian, Eskimo, all other), 1945.

	(2) Number of deaths, tuberculosis (all forms, respiratory, other forms), by age (1-year intervals up to 5, 5-year intervals up to 100). (3) Number of deaths, tuberculosis (all forms, respiratory, other forms), by months, 1945. (4) Number of deaths, infants (under 1 day, by days under 1 month, by months under 1 year), tuberculosis (all forms, respiratory, meninges), 1945. (5) Infant mortality rates, tuberculosis (all forms, respiratory, meninges), 1945.
II. *Vital Statistics of the United States, 1945, Part II—by Place of Residence*, National Office of Vital Statistics, Public Health Service, Federal Security Agency. (There is only one rate table in this volume. Seven tables present data on the number of deaths by age, race, sex, and place.)	(a) Tuberculosis death rates for the United States, for the major geographic divisions and for each State, 1945. (b) Number of deaths, tuberculosis (all forms, respiratory and other forms), by calendar months, for the United States and for each State, 1945. (c) Number of deaths, tuberculosis (all forms, respiratory, other forms), by race (white, nonwhite) and sex, by age (1-year intervals up to 5, 5-year intervals from 5 to 100), for each State, 1945. (d) Number of deaths, tuberculosis (all forms and each form), by race (white, nonwhite) and sex, for the United States and for each State, 1945. (e) Number of deaths, tuberculosis (all forms, respiratory, meninges, other forms) of infants under 1 year for the United States—by calendar month—by age in months (in days for ages under 1 month), by race (all races, white, Negro, other races)—by rural and by large and small urban place, by race (white, nonwhite), United States, 1945. (f) Number of deaths, tuberculosis (all forms), each State, each county, and each urban place having, in 1940, a population of 10,000 or more, United States, 1945.
III. *Vital Statistics—Special Reports, State Summaries, 1945*, Vol. 26, Nos. 1–54, National Office of Vital Statistics, Public Health Service, Federal Security Agency.	(a) Death rates, tuberculosis (all forms, respiratory, other forms), each State, 1943, 1944, and 1945. (b) Number of deaths (total, white, nonwhite) by age groups for the five leading causes of death, each State, 1945. Tuberculosis (all forms) appears in some of the age groups (seven unequal intervals). (c) Number of deaths, tuberculosis (all forms, respiratory, other forms), by age, (seven unequal intervals) each State, 1945.

WHERE YOU WILL FIND IT

(There is a separate summary for each State and Territory and one for the United States. Number of deaths and death rates by age, race, sex, and by institutions are presented.

One table in each State summary gives the leading causes of death by selected age groups. For comparing the rank order of each State by cause of death, a pamphlet prepared by the Tuberculosis Control Division will be useful. It is titled *Leading Causes of Death in the United States & States, 1945.*)

WHAT YOU WILL FIND

(d) Number of deaths, tuberculosis (all forms, repiratory, other forms), in hospitals and other institutions by type of institution, each State, 1945.

(e) Number of deaths and death rates, tuberculosis (all forms), infants (under 1 year and under 1 month), each State, 1940–45.

The United States Summary contains more data than the State or Territory summaries and presents it in more detail.

(f) Similar to (a) for the United States, 1935–45.

(g) Number of deaths and death rate, tuberculosis (all forms), United States, 1945.

(h) Same as (b) for the United States, 1945.

(i) Death rates and number of deaths, tuberculosis (all forms, respiratory, other forms), United States, 1935–45.

(j) Death rates and number of deaths, tuberculosis (all forms, respiratory, other forms), by age (under 1 year and by 5-year intervals to 75), United States, 1945.

(k) Similar to (d). More detailed break-down of institutions; type of ownership or control also shown, United States, 1945.

(l) Number of deaths, tuberculosis (all forms, respiratory, all other forms) by race (white, Negro, Indian, Chinese, Japanese, all other), United States, 1945.

(m) Similar to (e), tuberculosis (all forms, respiratory, meninges, all other forms). Also shows race (white and nonwhite) and infant mortality rate, United States, 1945.

The summaries for the outlying possessions (Alaska, Hawaii, Puerto Rico, and the Virgin Islands) are similar, with the exceptions noted below, to the State summaries.

(n) Similar to (a) but shows number of deaths instead of death rates.

(o) Puerto Rico, similar to (e) but has data for 1945 only.

(p) Virgin Islands, number of deaths, tuberculosis (all forms), by Islands.

(q) Alaska, number of deaths, tuberculosis (all forms, respiratory, all other forms), by race (Indian, Eskimo, Aleut, other native, white, all other), 1943, 1945.

(r) Hawaii, similar to (q) (Hawaiian, Part-Hawaiian, Puerto Rican, Caucasian, Chinese, Japanese, Korean, Filipino, all other), 1943–45.

V. *Deaths and Death Rates for Each Cause, United States, 1943–1945*, Vol. 27, No. 2, National Office of Vital Statistics, Public Health Service, Federal Security Agency. (Each cause of death by number and rate.)	(a) Number of deaths and death rates for tuberculosis (all forms) each form separately—numbers 13 through 22 in the International List of Causes of Death), United States, 1943–45.
V. *Deaths and Death Rates for Selected Causes by Age, Race, and Sex, United States, 1945*, Vol. 27, No. 11, National Office of Vital Statistics, Public Health Service, Federal Security Agency. (Number of deaths and death rates, tuberculosis (all forms), by age, race and sex, United States, 1945.)	(a) Death rates, tuberculosis (all forms), by race (white, nonwhite and sex, United States, 1945. (b) A line chart showing death rates, tuberculosis (all forms), by age under 1 year and by 5-year intervals to 75), race (white, nonwhite), and sex, United States, 1945. (c) Death rates adjusted for age, tuberculosis (all forms), by race (white, nonwhite and sex, United States, 1943–45. Also the percent change in rates from 1943 to 1944 and from 1944 to 1945. (d) Number of deaths tuberculosis (all forms, respiratory, other forms, by age (under 1 year and by 5-year intervals up to 100), race (white, Negro, other and sex, United States, 1945. (e) Death rates, tuberculosis (all forms, respiratory, other forms), by age (under 1 year and by 5-year intervals up to 75), race (white, nonwhite) and sex, United States, 1945.
VI. *Deaths and Death Rates for Selected Causes, United States, Each Division and State, 1945*, Vol. 27, No. 3, National Office	NOTE: State and geographic data are by place of residence. (a) Death rates, 10 leading causes of death including tuberculosis (all forms), United States, 1943–45; percent change, 1943–44 and 1944–45. (b) Death rates, 10 leading causes of death in the 9 major geographic areas, United States, 1945; percent change, 1944–45. Includes tuberculosis (all forms).

WHERE YOU WILL FIND IT	WHAT YOU WILL FIND
of Vital Statistics, Public Health Service, Federal Security Agency. (Number of deaths and death rates, tuberculosis, United States, each State and each of the major geographic divisions, 1945. The divisions referred to are the nine major geographic divisions of the United States: New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, Pacific).	(c) Graphic presentation using eight maps of the United States showing death rates (all causes and seven leading causes), including tuberculosis (all forms). Each State is shown in one of five patterns of cross-hatching representing ranked rates from highest to lowest. (d) Number of deaths and death rates, tuberculosis (all forms, respiratory, other forms), for the United States, for each of the nine major geographic divisions, and for each State, 1945.
VII. *Vital Statistics—Special Reports, National Summaries, 1945*, Vol. 27, No. 21, National Office of Vital Statistics, Public Health Service, Federal Security Agency.	NOTE: All data concern tuberculosis (all forms). (a) Number of deaths and death rates by race (white, nonwhite) and sex, United States, 1941–45. (b) Number of deaths and death rates by age (under 1 year, 1 to 4 years, 10-year intervals from 5 to 75), race (white, nonwhite), and sex, United States, 1945. (c) Number of deaths and death rates by age (as in (b) above), United States, 1941–45. (d) Number of deaths and death rates, by month, United States, 1945.

(Number of deaths and death rate for tuberculosis (all forms) by age, race, sex, and month, United States; number of deaths, each State and death rates, each State, 1945.)	(e) Number of deaths and death rates, by race (white, Negro, Indian, Chinese, Japanese, other), United States, 1940 and 1945. (f) Number of deaths and percent distribution by type of institution (general hospital, tuberculosis hospital, mental institution, etc.) and type of control (Federal, State, private, etc.), United States, 1945. (g) Number of deaths and death rates for the United States, for each of the nine major geographic divisions, and for each State, by place of residence, 1941–45.
VIII. *Current Mortality Analysis*, Vol. 4, 5, 6, Nos. 1–13, National Office of Vital Statistics, Public Health Service, Federal Security Agency. (This is the latest information available on tuberculosis mortality. Each monthly issue contains estimates of the death rate for specified causes of death based on a 10-percent sample of death certificates received in vital statistics offices and is available 60 to 75 days after the end of the month to which it refers.)	NOTE: Volume 5 pertains to the year 1947; Volume 6 to the year 1948. (a) A series of charts shows for a period of 1 year by months the expected behavior of the tuberculosis (all forms) death rate, the range of nonsignificant deviation from the expected trend line and the death rate as observed from the 10-percent sample. Most of the issues chart this information for the United States as a whole: one or more issues show separate charts for each of the nine major geographic divisions. (b) The number of deaths in the sample and the death rate as observed from the sample, tuberculosis (all forms, respiratory, other forms), for the reporting area (substantially the whole United States) and tuberculosis (all forms) for the nine major geographic divisions. A summary for the year, which is available approximately 6 months after the end of the year shows the following information: (c) Estimated number of deaths, estimated death rate and estimated percent error, tuberculosis (all forms, respiratory and other forms), compared with the actual death rate for the preceding 6 years, United States. (d) Estimated number of deaths and estimated death rates for tuberculosis (all forms), by age (6 unequal intervals), race (white, nonwhite) and sex, year of report and 6 preceding years, United States.

WHERE YOU WILL FIND IT	WHAT YOU WILL FIND
IX. "Tuberculosis Mortality in the United States and in Each State: 1945" by Elizabeth H. Pitney and Richard V. Kasius, *Public Health Reports*, Vol. 62, No. 14 (Tuberculosis Control Issue No. 14), Public Health Service, Federal Security Agency. (Death rates and number of deaths from tuberculosis for 1945; in some distributions as early as 1910. Some of the tables present data for all forms combined; some for each form separately; some compare respiratory tuberculosis with "other forms." There are distributions by race, sex, age, States, other geographic units and war veteran status. One table deals with proportionate mortality).	NOTE: Data for States are by place of residence. (a) Death rates, tuberculosis (all forms), by race (white, nonwhite) and sex, United States, 1910–45. (One table and one graph.) (b) Death rates and number of deaths, tuberculosis (all forms), by age (5-year intervals to 35, 10-year intervals to 75), race (white, nonwhite), and sex, United States, 1944, 1945, 1939–41 average and 1942–44 average. (One table and one graph.) (c) A graph of proportionate mortality (tuberculosis deaths as a percent of all deaths) by age (10-year intervals to 80), race (white, nonwhite), and sex, United States, 1945. (d) Percentage distribution of tuberculosis deaths by age (four unequal intervals), and sex, United States, 1945. (e) Percentage distribution (graph) of deaths from tuberculosis (all forms), by age (same as (d) above), United States, 1944, 1945, 1939–41 average and 1942–44 average. (f) Number of deaths from tuberculosis (all forms) among war veterans, by specified war, United States, 1944, 1945. (g) Death rates and number of deaths from tuberculosis (all forms) for nonwhites by specified race (Negro, Indian, Chinese, Japanese, other), United States, 1940–45. (h) Map of the United States showing the geographic distribution of tuberculosis (all forms), rates by quartiles, each State, 1945. (i) Number of deaths and death rates, tuberculosis (all forms), United States and each State, 1944, 1945, 1939–41 average, and 1942–44 average. Percent change in rates from 1944 to 1945 and from 1939–41 average to 1942–44 average. (j) Number of deaths from tuberculosis (all forms), number of deaths from all causes, proportionate mortality (deaths from tuberculosis as a percent of deaths from all causes), by age (four unequal intervals), race (white, nonwhite) and sex, Florida, 1941–45. (k) Number of deaths and death rates, tuberculosis (all forms and for 10 specified forms), United States, 1945. (l) Death rates, tuberculosis (all forms, respiratory, other forms) by race (white, nonwhite), Death Registration States, 1910–45.

(m) Number of deaths and death rates, tuberculosis (respiratory, nonrespiratory) by age (5-year intervals to 35, 10-year intervals to 75), race (white, nonwhite), and sex, United States, 1945.

(n) A graph of death rates from nonrespiratory tuberculosis by age (10-year intervals to 80), race (white, nonwhite) and sex, United States, 1945.

(o) Number of deaths from tuberculosis (all forms, respiratory, other forms), and death rates from tuberculosis (respiratory, other forms), United States and each State, 1945.

(p) A map similar to (h) for nonrespiratory tuberculosis, United States, 1945.

X. "Tuberculosis Mortality in Major Cities: United States, 1945" by Sara A. Lewis and Richard V. Kasius, *Public Health Reports*, Vol. 63, No. 1 (Tuberculosis Control Issue No. 23). Public Health Service, Federal Security Agency.

(Data on the number of deaths from tuberculosis and proportionate mortality ratios for tuberculosis (all

NOTE: Data are by place of residence.

(a) Proportionate mortality ratios, tuberculosis (all forms), by age (six unequal intervals), race (white, nonwhite), and sex, for cities of 100,000 or more and places under 100,000, United States, 1945. (One table and one graph.)

(b) Proportionate mortality ratios and number of deaths, tuberculosis (all forms), and deaths (all causes), by age (six unequal intervals), race (white, nonwhite), and sex, cities of 100,000 or more, United States, 1939–41 average, 1942–44 average, 1944, 1945. (One table and two graphs.)

(c) Proportionate mortality ratios adjusted for age, and unadjusted by race (total, white, nonwhite), sex, population-size of city and by geographic location (Northwest, Middle West, South, Far West), 92 cities (100,000 or more), United States, 1945. (One table and two graphs.)

(d) Proportionate mortality ratios and rank order for each of the 92 cities (100,000 or more), by race (white, nonwhite), 1939–41 average compared with 1942–45 average; each city by population size group, geographic region and race (white, nonwhite) for 1945.

WHERE YOU WILL FIND IT	WHAT YOU WILL FIND
forms) in major cities. A proportionate mortality ratio for a disease is the number of deaths from that disease expressed as a percent of deaths from all causes. An analysis of the data and a brief explanation of techniques used comprise the text of the article).	(e) Number of deaths, tuberculosis (all forms), and deaths (all causes), by race (white, nonwhite), sex, population size and geographic location, cities over 100,000, United States, 1945. (f) Number of deaths from tuberculosis (all forms), by age (six unequal intervals), race (total, white, nonwhite), and sex, 92 cities (100,000 or more), United States, 1945.
XI. "Deaths from Respiratory Tuberculosis in Institutions in the United States, 1945" by Richard V. Kasius and Evelyn H. Halpin, *Public Health Reports*, Vol. 62, No. 36 (Tuberculosis Control Issue No. 19), Public Health Service, Federal Security Agency. (This article is chiefly concerned with deaths from respiratory tuberculosis in institutions, including hospi-	(a) Number and percent distribution of deaths from respiratory tuberculosis, not in institutions and in institutions, by type of institution (general hospitals, tuberculosis hospitals, nervous and mental institutions, etc.) and by type of control (Federal State, nonprofit, etc.), United States, 1944, 1945, 1939–41 average and 1942–44 average. (b) Number and percent distribution of deaths from respiratory tuberculosis, in each type of institution classified according to the type of control of the institution, United States, 1945. (c) A table similar to (a) which compares the number and percent of deaths from tuberculosis (respiratory) with tuberculosis (other forms), United States, 1945. (d) A table similar to (a) which presents a classification by race (white, nonwhite) and sex, United States, 1945. (e) Number and percent of deaths from respiratory tuberculosis, not in institutions and in institutions, by type of institution, age (five unequal intervals), and race (white, nonwhite), United States, 1945. (f) Number of deaths from respiratory tuberculosis, not in institutions, and in institutions, by type of institution, and by type of control, United States and each State, 1945.

tals. For purposes of comparison it also shows the number of deaths not in institutions and the number of deaths from other forms of tuberculosis. The tables and charts in the article present distributions by type of institution, and by age, race, sex, length of stay and State.)

(g) Number of deaths from respiratory tuberculosis, by race (white, nonwhite) and sex, for persons in institutions and for persons not in institutions, United States and each State, 1945.

The summaries (h) through (l) are based upon a 10-percent sample of death certificates received in vital statistics offices of 43 States and the District of Columbia, 1945.

(h) Number and percent distribution of deaths from respiratory tuberculosis, race (white, nonwhite), and sex, by age (five unequal intervals), in institutions and not in institutions, reporting area 1945.

(i) Number and percent distribution of deaths from respiratory tuberculosis, age (five unequal intervals), race (white, nonwhite), and sex, by length of stay in institutions (weeks, months, etc.) reporting area, 1945.

(j) Number and percent distribution of deaths from respiratory tuberculosis in institutions, type of institution and type of control, by length of stay, reporting area, 1945.

(k) A bar graph which shows the percent distribution of deaths from respiratory tuberculosis, by length of stay, and by sex, reporting area, 1945.

(l) Median length of stay in institutions prior to death from respiratory tuberculosis, by type of institution, and by type of control, reporting area, 1945.

(m) A map of the United States which shows, for each State, the percent of deaths from respiratory tuberculosis which occurred outside of institutions, 1945.

(n) A bar graph which shows the percent distribution of deaths from respiratory tuberculosis by type of institution and by sex, United States, 1945.

X] "The Notifiable Diseases, Prevelance of Certain Important Communicable Diseases, by States, 1945," Supplement 193 to Public Health Reports, Public Health Service, Federal Security Agency.

(a) Number of cases newly reported, case rate per 100,000, number of deaths registered, death rate, and number of cases per death, tuberculosis (all forms) 43 States and respiratory tuberculosis, 24 States, 1945.

(b) Number of cases newly reported by months, tuberculosis (all forms), United States respiratory tuberculosis, 26 States, 1945.

(c) Number of deaths registered, by months, tuberculosis (all forms), United States respiratory tuberculosis, 44 States, 1945.

(d) Number of cases newly reported and number of deaths reported, tuberculosis (al forms, respiratory), each State, 1945.

WHERE YOU WILL FIND IT	WHAT YOU WILL FIND
(The number of newly reported cases of tuberculosis and the number of tuberculosis deaths registered, 1945.)	NOTE: For data for earlier years, a quotation from this report may be helpful: "Tabulations of reported cases of, and deaths from, the principal notifiable diseases have been issued by the Public Health Service since 1912 (reprints numbered 163, 208, 298, 345, 426, 505, 551, 643, 681, 791, 879, 974, 1056, and 1132, and supplements numbered 67, 73, 79, 88, 104, 105, 109, 112, 117, 119, 134, 147, 160, 163, 166, 172, 174, 182, and 190)." Data for 1946 appeared in Public Health Reports, Vol. 62, No. 11, March 14, 1947.
XIII. *Estimated Population of the United States, by Age, Color, and Sex: 1945 and 1944,* Series P–46, No. 2, Bureau of the Census, U. S. Department of Commerce. (Two separate population estimates are presented; one includes the armed forces overseas, the other excludes them.)	(a) Estimated population of the continental United States, including armed forces overseas, by age (5-year intervals to 75, 14 and over, and 21 and over), race (white, nonwhite), and sex, July 1, 1944 and July 1, 1945. Also a percent distribution. (b) A table similar to (a) excluding the armed forces overseas. (c) A table similar to (a) for the enumerated population as of April 1, 1940.
XIV. *Estimated Population of the United States, by States: 1940 to 1945,* Series P–46, No. 3, Bureau of the Census, U. S. Department of Commerce. (Two separate estimates of the population by States are	(a) Estimated population of the United States, excluding the armed forces overseas, and the estimated civilian population, by region (Northeast, North Central, South, West), geographic division (New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, Pacific), and each State, July 1, 1945, and April 1, 1940. Also number and percent change in population from 1940 to 1945. (b) Population changes, United States (region, division, and each State), by component of change (estimated natural increase, estimated net loss to the armed forces, and estimated net gain or loss through civilian migration), April 1, 1940, to July 1, 1945.

made; one excludes the armed forces overseas, the other is an estimate of the civilian population.)	(c) Estimated population of the United States, excluding armed forces overseas, by region, division, and State, July 1, 1940, to July 1, 1945. (This is the estimate used for computing death rates.) (d) Similar to (c), civilian population only.
XV. *Estimated Civilian Population of the United States, by Counties: November 1, 1943*, Series P–44, No. 3, Bureau of the Census, U. S. Department of Commerce. (Although this is earlier than the other data presented in this list it is the latest data on individual counties. The estimates are based on registration for War Ration Book No. 4.)	(a) Estimated civilian population, United States, for each region, geographic division, and State, November 1, 1943, and April 1, 1940. Also number and percent change from April 1, 1940, to November 1, 1943. (b) Similar to (a) for metropolitan counties (137 areas). (c) Similar to (a) for each county.
XVI. *Suggested Procedures for Estimating the Current Population of Counties*, by Hope T. Eldridge, P–47, No. 4, Bureau of the Census, U. S. Department of Commerce. (The two methods described may also be applied to cities.)	(a) This publication suggests two methods for estimating the current population of counties in the United States. Either of the methods can be used to estimate the current population of cities or of other places for which the necessary basic and ancillary information is available. The first method, which is spelled out in detail, consists of collecting estimates of changes in the major components of the population and of estimating other changes by reference to source material such as school registration. The second method, which is presented in outline only, is the life table or cohort method of estimation. The sources of basic data are explicitly named or described.

WHERE TO OBTAIN SUCH REFERENCE MATERIAL

Your local library Reference room.	may have many or all of the items I through XVI.
The Bureau of The Census Department of Commerce, Washington 25, D. C.	will furnish items XIII, XIV, XV, and current population reports.
Superintendent of Documents The Government Printing Office, Washington 25, D. C.	will furnish item I (price, $1.75) and item II (price $3.50).
The National Office of Vital Statistics Public Health Service, Washington 25, D. C.	will furnish items III through VIII, various publications concerning mortality data and a pamphlet entitled "Current Publications of the National Office of Vital Statistics."
The Tuberculosis Control Division Attention: Publications Unit, Public Health Service, Washington 25, D. C.	will furnish items IX through XII; the pamphlet, "The Leading Causes of Death, 1945"; and material concerning general or specific phases of tuberculosis work.

COPYING X-RAY FILMS [1]

By DAVID M. GOULD, *Surgeon;* WILLARD W. VAN ALLEN, *Physicist;* and
CHARLES M. BAILEY, *Photographer, Public Health Service*

The need frequently arises for making copies of radiographs for exhibition, teaching and other special purposes. Although such reproductions are obtainable from companies specializing in this work, the cost and effort involved often make it impractical for the radiologist to avail himself of this service. A simple method by which copies of radiographs of special interest could be made would, therefore, be of considerable value to the radiology department or radiologist desiring such duplicates. To meet this need, the method and equipment to be described were devised.

The choice of procedure is governed by the requirements in the copy. Any method for reproducing radiographs, to be fully satisfactory, must meet certain standards. The reproduction must be a faithful copy, preserving all the detail and clarity of the original film. In chest films especially, where pathologic lesions are often recorded by very slight variations in density, it is imperative that the copy, to be of any value at all, must have the same tonal scale. Furthermore, to be practical, it is desirable that the whole process be as nearly automatic as possible, involving a minimum of judgment and special skill on the part of the operator.

There are, in general, three methods of copying radiographs. Solarization, whereby the film is given an extreme over-exposure, has been used as a contact printing method, and produces copies satisfactory for some purposes. However, due to the characteristics of a solarized emulsion this method under average conditions does not maintain the faithfulness of reproduction required for the demonstration of subtle lesions. A second possibility is the production of direct copies by chemical reversal of a contact print on direct positive film. This method has serious disadvantages in that it requires extremely critical control throughout several steps in the processing procedure, and, with materials presently available, makes the faithful reproduction of the whole tonal range of the original a very difficult matter even in the hands of an expert. Furthermore, it requires special darkroom equipment and techniques.

The third and most promising method consists of preparing an intermediate "positive" film from which the final copy is produced by enlargement or contact printing. This method has the advantages of simplifying the problem of reproducing the whole tonal range of the original, requiring no unusual darkroom procedure and making possible the use of automatic exposure control without unduly complicated apparatus. Furthermore, by using 70-mm. film for the intermediate with subsequent enlargement, copies of any desired size may be obtained and the intermediate easily filed for future copies.

---

[1] From the Office of Radiology, Tuberculosis Control Division.

A photograph of the apparatus used in making the intermediate

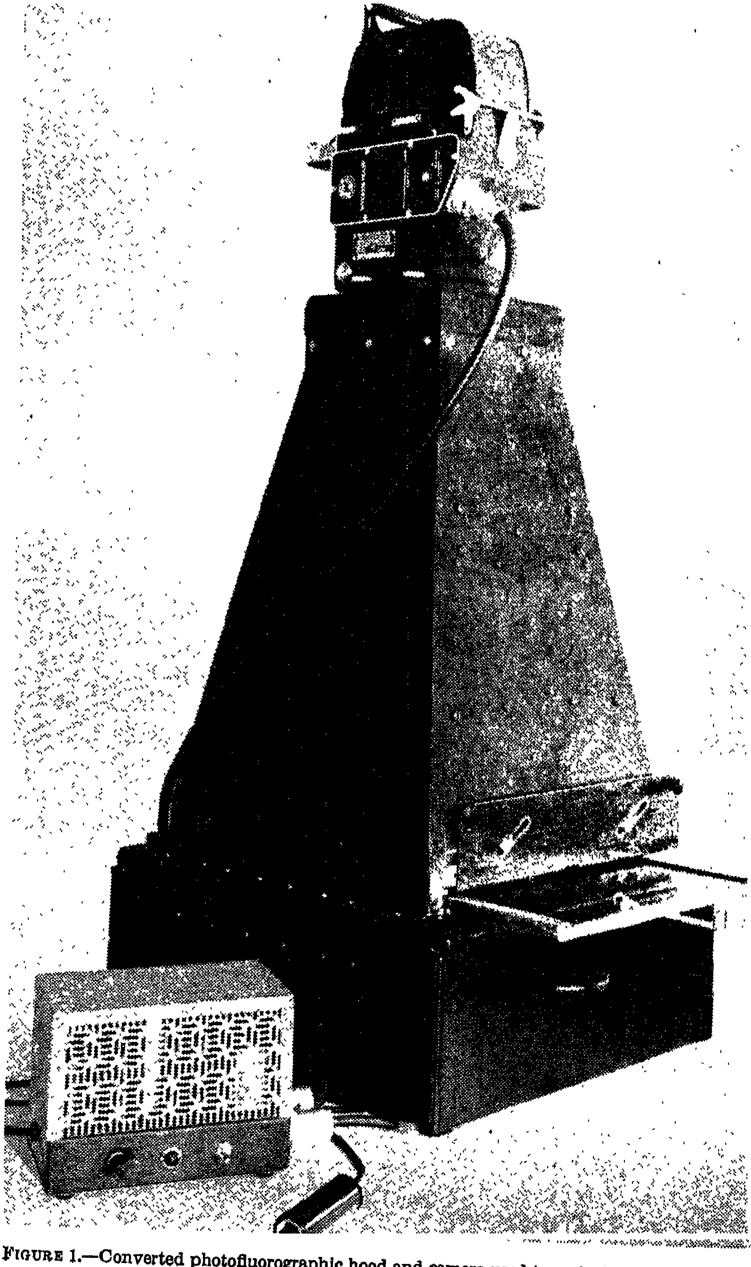


FIGURE 1.—Converted photofluorographic hood and camera used to make 70-mm. intermediate "positives" from 14″ x 17″ radiographs.

"positives" is shown in figure 1. The equipment consists of a conventional photofluorographic hood and automatic 70-mm. camera mounted vertically on an illuminator. The fluorescent screen and grid are removed and a sliding glass film holder substituted. If it is desired to produce copies of uniform density from originals of varying quality, the phototube camera and phototimer are retained for the control of exposure. It is necessary to alter the phototimer somewhat in order to cover the required exposure range, since longer exposures are needed than in photofluorography. On the other hand, if it is desired to copy exactly the quality of the original, then a fixed exposure is all that is required. This exposure may be obtained from a simple time switch connected to the illuminator. Also it is desirable to stop down the f1.5 lens in the automatic camera to a smaller aperture in order to improve the definition.

With this equipment, all that is required of the operator is to place the film to be copied in the film holder, close the door and push the exposure switch. The exposure is then made automatically and the film advanced in the camera for the next copy.

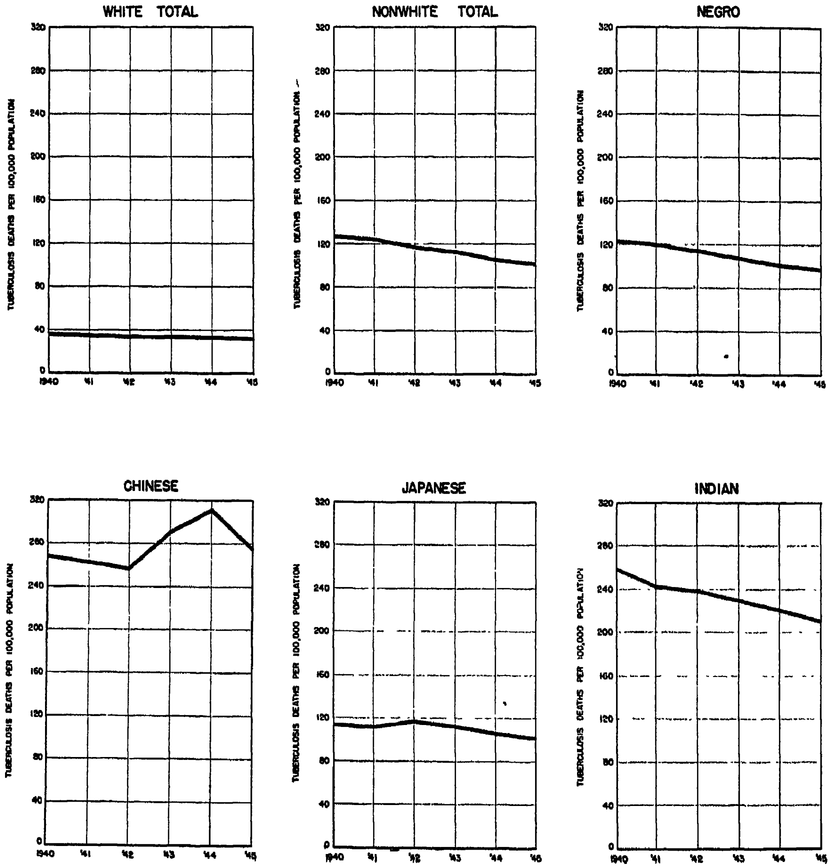
A very satisfactory film for preparing the intermediate negative is Eastman Negative Material #5203 developed in DK 76. This is a slow speed, fine grain emulsion with high resolving power. It permits enlargements up to the original size without objectionable graininess. Where full size reproductions are not required, Ansco Supreme film developed in DK 76, gives good results and is much faster.

The final step in preparing the reproduction involves printing from the intermediate in an ordinary photographic enlarger. Obviously prints of any desired size within the physical limitations of the intermediate emulsion may be obtained and may be made on film, paper or lantern slides. For transparencies, Eastman Contrast Process Ortho Film developed in DK 60A has been found satisfactory. From intermediates prepared as described above, prints may be made with fixed exposure for all copies of a given size and on a given material. However, it is often desirable to vary the printing exposure somewhat in order to control the contrast of the copy. Once the proper processing procedures are determined, therefore, the whole operation of copying becomes routine.

The method described above gives very faithful reproductions of chest films. It has been used successfully for both transparencies and paper prints. Furthermore, it allows considerable flexibility of control over the characteristics of the reproduction. When desired, the contrast of the copy may be made greater or less than the original. This is sometimes desirable when paper prints are wanted for halftones. Furthermore, it is a distinct advantage to be able to prepare copies of different size from a single intermediate.

DEATH RATES FOR TUBERCULOSIS (ALL FORMS) BY RACE

UNITED STATES 1940 – 1945



INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED MAY 15, 1948

Summary

A total of 142 cases of poliomyelitis was reported for the current week, as compared with 107 last week and a 5-year (1945–47) median of 34. Of the 20 States reporting cases, the 7 reporting more than 2 cases each are as follows (last week's figures in parentheses): Texas 60 (55), California 21 (14), North Carolina 18 (8), New Jersey 7 (2), Illinois 6 (2), Louisiana 6 (1), and Pennsylvania 4 (0). The 7 States reporting more than 11 cases each during the 8 weeks since March 20 (approximate average date of lowest weekly incidence) are as follows (corresponding figures last year and 1944–47 averages in parentheses): Texas 173 (16–28), California 55 (68–37), North Carolina 42 (1–4), New York 16 (25–27), New Jersey 16 (4–3), Indiana 15 (1–2), Iowa 15 (3–3). The total since March 20 is 463, as compared with a 5-year median of 230 (reported for the period last year).

The incidence of measles increased from 28,343 cases last week to 28,895 for the current week, as compared with a 5-year median of 25,813. The net increase is accounted for chiefly in the reports of Massachusetts, Connecticut, New York, New Jersey, Michigan, Maryland, West Virginia, Florida, Utah, Washington, Oregon, and California. During the 4-week period since April 17, a total of 113,102 cases has been reported, as compared with 33,797 for the same period last year and a 5-year average of 84,882.

No occurrence of smallpox was reported during the week. One case of anthrax was reported, in New Jersey. Of 8 cases of Rocky Mountain spotted fever, Virginia, Kentucky, and Wyoming reported 2 each, and New York and Delaware 1 each.

Figures for the year to date above the corresponding median expectancies have been reported for the dysenteries, infectious encephalitis, poliomyelitis, tularemia, and undulant fever.

Deaths recorded during the week in 93 large cities in the United States totaled 9,329, as compared with 9,266 last week, 9,331 and 8,901, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 9,202. The total to date is 198,170, as compared with 198,445 for the corresponding period last year. Infant deaths for the week totaled 743, as compared with 655 last week and a 3-year median of 613. The cumulative figure is 13,815, as compared with 15,841 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended May 15, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, ases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	May 15, 1948	May 10, 1947		May 15, 1948	May 10, 1947		May 15, 1948	May 10, 1947		May 15, 1948	May 10, 1947	
NEW ENGLAND												
Maine	0	1	1	1	------	------	16	102	102	0	1	1
New Hampshire	0	0	0	------	------	------	19	12	12	0	0	0
Vermont	0	0	0	------	7	------	7	172	66	0	0	0
Massachusetts	4	13	4	------	------	------	1,456	402	971	2	1	2
Rhode Island	0	1	1	------	------	1	18	173	52	0	0	1
Connecticut	1	1	1	3	8	1	154	1,072	491	1	3	3
MIDDLE ATLANTIC												
New York	9	16	16	[1] 4	[1] 1	[1] 5	3,142	636	1,555	8	5	24
New Jersey	7	8	7	3	2	4	2,097	461	1,192	3	1	6
Pennsylvania	3	16	10	(2)	(2)	[2] 1	2,135	284	937	8	4	12
EAST NORTH CENTRAL												
Ohio	1	12	12	4	2	3	1,214	918	519	3	2	12
Indiana	10	3	6	1	2	2	1,024	155	179	0	5	5
Illinois	4	4	4	------	4	11	1,262	228	605	4	4	14
Michigan [3]	0	10	3	1	2	2	1,904	116	902	0	1	5
Wisconsin	0	2	1	20	10	22	1,836	365	2,320	1	2	3
WEST NORTH CENTRAL												
Minnesota	0	3	3	------	------	------	451	555	379	0	1	2
Iowa	2	0	2	------	70	1	191	1,248	183	7	2	1
Missouri	2	5	4	6	5	2	286	70	126	1	3	7
North Dakota	0	3	1	------	21	2	20	85	85	0	0	1
South Dakota	0	0	0	------	------	------	49	128	39	0	2	0
Nebraska	2	1	1	2	------	2	245	20	80	7	0	0
Kansas	5	4	4	1	1	------	60	17	320	0	0	1
SOUTH ATLANTIC												
Delaware	0	1	0	------	------	------	45	2	13	0	0	0
Maryland [3]	5	6	6	1	10	8	668	41	263	3	3	3
District of Columbia	1	0	0	------	------	1	116	8	123	0	2	2
Virginia	3	3	3	184	471	102	219	272	326	1	0	9
West Virginia	3	2	2	22	15	11	200	48	159	0	1	1
North Carolina	5	8	8	------	------	------	19	155	280	2	1	2
South Carolina	4	3	4	206	384	184	148	130	130	0	1	1
Georgia	0	2	2	3	11	10	64	166	141	0	0	1
Florida	0	3	3	8	30	12	271	54	136	0	2	2
EAST SOUTH CENTRAL												
Kentucky	4	3	3	------	3	1	224	20	113	0	1	4
Tennessee	3	1	1	20	48	29	129	37	92	3	4	9
Alabama	2	3	3	16	220	29	79	223	223	2	1	5
Mississippi [3]	7	3	7	------	9	------	32	13	------	0	1	3
WEST SOUTH CENTRAL												
Arkansas	0	4	2	41	39	29	85	91	98	0	1	2
Louisiana	4	2	2	2	22	5	34	23	31	1	1	2
Oklahoma	2	1	3	6	78	44	55	8	91	1	3	1
Texas	15	12	23	430	600	472	2,427	386	441	4	2	10
MOUNTAIN												
Montana	1	2	2	3	6	6	82	99	99	0	0	0
Idaho	1	0	0	2	3	------	75	2	49	0	1	1
Wyoming	0	1	0	------	1	1	67	14	38	0	0	0
Colorado	1	8	8	1	27	12	391	104	170	0	0	1
New Mexico	0	0	0	2	1	1	93	19	23	0	1	0
Arizona	4	2	2	51	131	25	489	45	45	0	0	0
Utah [3]	2	2	0	------	6	6	452	7	252	0	0	0
Nevada	0	0	0	------	------	------	5	15	------	------	0	0
PACIFIC												
Washington	1	2	4	4	3	1	829	23	236	1	2	4
Oregon	1	3	1	15	18	8	241	------	158	[4] 1	0	2
California	9	11	16	68	27	27	3,770	270	1,510	7	10	17
Total	128	191	191	1,131	2,298	1,150	28,895	9,494	25,813	71	75	178
19 weeks	3,603	5,012	5,012	131,466	292,674	183,596	363,835	116,715	368,642	[4] 1,525	1,671	4,345
Seasonal low week [5]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	9,961	12,578	13,746	175,024	325,649	325,649	398,781	139,602	406,655	[4] 2,307	2,643	6,797

[1] New York City only.
[2] Philadelphia only.
[3] Period ended earlier than Saturday.
[4] Delayed report: Oregon, week ended Apr. 17, meningococcus meningitis, 1 case.
[5] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended May 15, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943–47	Week ended		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	May 15, 1948	May 10, 1947		Dec. 15, 1948	Dec. 10, 1947		May 15, 1948	May 10, 1947		May 15, 1948	May 10, 1947	
NEW ENGLAND												
Maine	0	0	0	6	3	14	0	0	0	0	0	0
New Hampshire	0	0	0	2	4	4	0	0	0	0	1	0
Vermont	0	0	0	3	9	9	0	0	0	0	2	0
Massachusetts	0	0	0	234	109	345	0	0	0	[6] 5	7	1
Rhode Island	0	0	0	10	9	17	0	0	0	0	0	0
Connecticut	0	0	0	18	34	69	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	2	1	1	[7] 219	264	594	0	0	0	[6] 4	3	3
New Jersey	7	1	0	67	97	154	0	0	0	0	1	1
Pennsylvania	4	0	0	290	210	380	0	0	0	[6] 1	1	3
EAST NORTH CENTRAL												
Ohio	1	0	1	273	195	312	0	0	1	1	3	2
Indiana	2	1	0	35	116	116	0	1	0	[6] 2	1	2
Illinois	6	0	1	103	87	202	0	0	0	[6] 4	1	1
Michigan [3]	1	0	0	183	131	152	0	0	0	2	2	2
Wisconsin	0	0	1	66	65	221	0	1	0	1	0	0
WEST NORTH CENTRAL												
Minnesota	0	2	0	37	52	60	0	0	0	0	0	0
Iowa	0	1	0	13	24	46	0	0	0	0	1	0
Missouri	2	3	0	16	41	62	0	2	0	1	0	2
North Dakota	1	1	0	5	4	5	0	0	0	0	0	0
South Dakota	0	0	0	1	4	9	0	0	0	0	0	0
Nebraska	0	1	0	19	27	27	0	0	0	1	0	0
Kansas	0	1	1	11	46	63	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	3	13	7	0	0	0	0	0	0
Maryland [3]	0	0	0	27	30	180	0	0	0	[6] 4	1	0
District of Columbia	0	0	0	3	9	18	0	0	0	0	0	0
Virginia	0	0	0	17	28	66	0	0	0	[6] 2	4	2
West Virginia	0	0	0	[7] 8	12	35	0	0	0	2	1	1
North Carolina	18	0	0	33	20	27	0	0	0	2	2	1
South Carolina	0	0	1	3	3	5	0	1	0	[6] 3	3	2
Georgia	0	0	0	19	0	15	0	0	0	[6] 3	2	3
Florida	1	0	1	7	4	4	0	0	0	4	2	1
EAST SOUTH CENTRAL												
Kentucky	1	1	1	0	25	32	0	0	0	4	2	1
Tennessee	0	1	0	9	9	28	0	0	0	0	1	2
Alabama	0	0	0	4	9	9	0	0	0	1	1	1
Mississippi [3]	0	0	2	0	3	5	0	0	0	1	0	0
WEST SOUTH CENTRAL												
Arkansas	0	0	0	3	2	10	0	0	0	3	4	2
Louisiana	6	2	1	3	2	3	0	0	0	3	3	4
Oklahoma	0	1	0	9	2	15	0	0	0	[6] 4	0	0
Texas	60	3	3	14	25	58	0	0	1	6	7	11
MOUNTAIN												
Montana	0	0	0	8	3	8	0	0	0	0	1	0
Idaho	2	0	0	[7] 9	3	10	0	0	0	1	1	1
Wyoming	0	0	0	5	0	8	0	0	0	0	0	0
Colorado	1	0	0	18	32	56	0	0	0	0	1	1
New Mexico	0	0	0	8	11	11	0	2	0	1	0	1
Arizona	2	2	1	4	6	10	0	0	0	0	0	0
Utah [3]	0	0	0	15	7	21	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	2	0	0	35	22	31	0	0	0	0	1	0
Oregon	2	0	0	19	10	36	0	0	0	0	4	1
California	21	12	10	81	136	166	0	0	0	[6] 7	5	3
Total	142	34	34	1.975	1,957	3,963	0	7	9	73	69	65
19 weeks	811	842	648	42,995	48,964	75,724	44	118	198	928	889	1,083
Seasonal low week [5]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	463	230	230	65,534	75,650	114,045	65	172	281	455	404	490

[3] Period ended earlier than Saturday.

[5] Dates between which the approximate low week ends. The specific date will vary from year to year.

[6] Including paratyphoid fever and salmonella infections reported separately, as follows: Massachusetts 4 (salmonella infection); New York 2 (salmonella infection); Pennsylvania 1 (salmonella infection); Indiana 1; Illinois 1; Maryland 1; Virginia 1; South Carolina 1; Georgia 1; Oklahoma 1; California 2.

[7] Including cases reported as streptococcal infections and septic sore throat.

Telegraphic morbidity reports from State health officers for the week ended May 15, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended May 15, 1948							
	Week ended—		Median 1943–47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	May 15, 1948	May 10, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	-	8	14	-	-	-	-	-	-	-	-
New Hampshire	3	4	2	-	-	-	-	-	-	-	-
Vermont	32	8	7	-	-	-	-	-	-	-	2
Massachusetts	44	117	137	-	-	-	1	-	-	-	2
Rhode Island	7	26	16	-	-	-	-	-	-	-	-
Connecticut	22	32	46	-	-	-	-	-	-	-	-
MIDDLE ATLANTIC											
New York	76	249	166	9	1	-	3	1	-	-	5
New Jersey	54	149	135	-	-	1	1	-	-	-	-
Pennsylvania	100	172	172	-	-	-	-	-	-	-	2
EAST NORTH CENTRAL											
Ohio	41	195	82	9	-	-	-	-	-	-	2
Indiana	26	48	12	-	-	-	1	-	-	-	2
Illinois	40	80	80	10	1	-	2	-	1	-	6
Michigan [3]	50	273	124	10	10	-	1	-	-	-	4
Wisconsin	85	192	84	-	-	-	-	-	-	-	12
WEST NORTH CENTRAL											
Minnesota	7	43	13	-	2	-	-	-	-	-	8
Iowa	7	27	27	-	-	-	-	-	-	-	-
Missouri	18	49	19	-	-	-	-	-	-	-	1
North Dakota	1	-	1	-	-	-	-	-	-	-	-
South Dakota	2	1	1	-	-	-	-	-	-	-	2
Nebraska	7	13	8	2	-	-	-	-	-	-	4
Kansas	46	48	39	-	1	-	-	-	-	-	-
SOUTH ATLANTIC											
Delaware	1	5	2	-	-	-	-	1	-	-	-
Maryland [3]	5	80	79	-	-	-	2	-	-	-	-
District of Columbia	1	8	8	-	-	-	-	-	-	-	-
Virginia	73	97	97	-	-	58	-	2	1	-	1
West Virginia	2	27	27	-	-	-	-	-	-	-	-
North Carolina	63	70	97	2	1	-	1	-	-	-	1
South Carolina	136	86	62	-	11	-	-	-	-	-	-
Georgia	21	23	17	1	1	-	-	-	-	2	2
Florida	24	43	34	3	-	-	-	-	1	2	2
EAST SOUTH CENTRAL											
Kentucky	-	31	31	-	-	-	-	2	-	-	-
Tennessee	36	35	29	1	-	-	-	-	1	-	1
Alabama	33	67	48	-	-	-	1	-	-	7	1
Mississippi [3]	1	10	-	1	-	-	-	-	2	1	2
WEST SOUTH CENTRAL											
Arkansas	33	55	11	4	-	-	-	-	8	-	1
Louisiana	1	16	4	2	-	-	-	-	-	-	2
Oklahoma	17	27	27	-	-	-	-	-	1	-	-
Texas	473	854	276	17	405	97	-	-	1	8	3
MOUNTAIN											
Montana	6	4	3	-	-	-	-	-	-	-	-
Idaho	5	9	7	-	-	-	-	-	-	-	-
Wyoming	5	3	4	-	-	-	-	2	-	-	1
Colorado	47	41	41	-	-	-	-	-	-	-	5
New Mexico	23	66	16	-	-	-	-	-	-	-	-
Arizona	35	44	28	-	-	20	-	-	-	-	3
Utah [3]	13	15	19	-	-	-	-	-	-	-	1
Nevada	-	-	1	-	-	-	-	-	-	-	-
PACIFIC											
Washington	19	25	26	1	-	1	-	-	-	-	-
Oregon	43	12	17	7	-	-	-	(8)	-	-	-
California	107	427	427	11	10	-	-	-	-	-	6
Total	1,891	3,914	2,576	90	443	186	13	8	16	20	84
Same week, 1947	3,914	-	-	63	233	194	6	7	20	26	112
Median, 1943–47	2,576	-	-	33	374	106	6	10	18	50	[9] 104
52 weeks: 1948	40,341	-	-	1,348	5,550	3,391	171	[8] 29	340	267	1,724
1947	51,914	-	-	891	5,536	3,813	127	28	590	716	1,980
Median, 1943–47	47,302	-	-	563	5,536	1,989	156	32	316	857	[9] 1,642

---

[3] Period ended earlier than Saturday.

[8] Correction: Oregon, week ended April 17, Rocky Mountain spotted fever 0 (instead of 1 case).

[9] 3-year median 1945–47.

Anthrax: New Jersey 1 case.

Alaska: Chickenpox 1, measles 1, influenza 1, mumps 3, whooping cough 2, pneumonia 2, scarlet fever 2
Territory of Hawaii: Rabies 0, measles 4, scarlet fever 6, whooping cough 14.

WEEKLY REPORTS FROM CITIES *

City reports for week ended May 8, 1948

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	1	0	1	0	1	0	3	0	0	------
New Hampshire:												
Concord	0	0	------	0	-------	0	0	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	-------	0	0	0	0	0	0	------
Massachusetts:												
Boston	7	0	------	0	270	3	7	0	73	0	0	5
Fall River	0	0	------	0	16	0	0	0	1	0	0	8
Springfield	0	0	------	0	6	0	0	0	3	0	0	------
Worcester	0	0	------	0	36	0	5	0	6	0	0	4
Connecticut:												
Bridgeport	0	0	------	0	-------	0	0	0	0	0	0	------
Hartford	0	0	------	0	1	0	1	0	1	0	0	------
New Haven	0	0	------	0	7	0	4	0	2	0	0	2
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	51	0	1	0	11	0	0	1
New York	13	0	------	0	1,500	6	64	1	86	0	0	22
Rochester	0	0	------	0	5	0	1	0	8	0	0	1
Syracuse	0	0	------	0	5	0	2	0	9	0	0	13
New Jersey:												
Camden	1	0	------	0	32	0	0	0	0	0	0	------
Newark	0	0	1	0	339	0	3	0	6	0	0	4
Trenton	0	0	------	0	6	0	1	0	1	0	0	------
Pennsylvania:												
Philadelphia	0	0	------	0	1,044	1	12	0	52	0	0	7
Pittsburgh	0	0	------	0	5	1	9	0	56	0	0	------
Reading	0	0	------	0	6	0	2	0	12	0	0	3
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	133	1	4	0	13	0	0	5
Cleveland	0	0	2	0	36	1	5	0	31	0	0	3
Columbus	0	0	------	0	73	0	1	0	3	0	0	------
Indiana:												
Fort Wayne	0	0	------	0	12	0	2	0	3	0	0	------
Indianapolis	1	0	------	0	268	0	0	0	9	0	0	3
South Bend	0	0	------	0	7	0	0	0	0	0	0	------
Terre Haute	0	0	------	0	-------	0	0	0	0	0	0	------
Illinois:												
Chicago	0	0	2	0	521	6	25	0	27	0	1	18
Springfield	0	0	------	0	-------	0	5	0	3	0	0	------
Michigan:												
Detroit	1	1	------	0	599	2	4	0	70	0	0	8
Flint	0	0	------	0	1	0	1	0	3	0	0	------
Grand Rapids	0	0	------	0	16	0	1	0	3	0	0	1
Wisconsin:												
Kenosha	0	0	------	0	91	0	0	0	0	0	0	------
Milwaukee	0	0	------	0	181	0	3	0	15	0	0	7
Racine	0	0	------	0	38	0	0	0	3	0	0	2
Superior	0	0	------	0	183	0	0	0	0	0	0	------
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	416	0	0	0	1	0	0	------
Minneapolis	0	0	------	0	32	0	2	0	11	0	0	1
St. Paul	2	0	------	0	49	0	5	0	7	0	0	3
Missouri:												
Kansas City	1	0	1	0	32	0	1	0	3	0	0	11
St. Joseph	0	0	------	0	1	0	0	0	1	0	0	------
St. Louis	6	0	1	0	124	1	9	0	10	0	0	------

---

* In some instances the figures include nonresident cases.

City reports for week ended May 8, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	1	125	1	1	0	1	0	0	2
Kansas:												
Topeka	0	0	------	0	14	0	0	0	1	0	0	3
Wichita	0	0	------	0	5	0	1	0	3	0	0	7
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	14	0	2	0	1	0	0	------
Maryland:												
Baltimore	1	0	------	0	326	0	11	0	12	0	0	6
Cumberland	1	0	------	0	------	0	0	0	1	0	0	------
Frederick	0	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	132	0	8	0	9	0	0	5
Virginia:												
Lynchburg	0	0	------	0	2	0	0	0	0	0	0	------
Richmond	0	0	------	0	4	0	2	0	5	0	0	3
Roanoke	0	0	------	0	------	0	0	0	3	0	0	------
West Virginia:												
Charleston	0	0	------	0	------	0	4	0	0	0	0	------
Wheeling	0	0	------	0	65	0	2	0	0	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	0	1	0	2	0	0	------
Wilmington	0	0	------	0	------	0	1	0	0	0	0	2
Winston-Salem	1	0	------	0	------	0	0	0	2	0	0	------
South Carolina:												
Charleston	0	0	25	1	1	0	3	0	0	0	1	12
Georgia:												
Atlanta	0	0	------	0	2	0	3	0	3	0	0	1
Brunswick	0	0	------	0	3	0	0	0	0	0	0	2
Savannah	0	0	------	0	------	0	0	0	0	0	0	3
Florida:												
Tampa	2	0	------	0	9	0	2	1	1	0	0	2
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	47	0	7	0	2	0	0	11
Nashville	0	0	------	0	------	0	0	0	1	0	0	------
Alabama:												
Mobile	0	0	1	1	------	0	0	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	4	0	11	0	2	0	1	0	0	------
Louisiana:												
New Orleans	2	0	1	0	2	1	3	0	0	0	1	------
Shreveport	0	0	------	0	------	0	3	1	0	0	0	------
Oklahoma:												
Oklahoma City	0	0	------	0	9	0	4	0	2	0	0	------
Texas:												
Dallas	2	0	------	0	244	0	0	0	0	0	1	------
Galveston	0	0	------	0	------	0	1	1	1	0	0	------
Houston	0	0	------	0	------	0	2	4	1	0	0	1
San Antonio	0	0	------	0	18	0	8	0	0	0	0	3
MOUNTAIN												
Montana:												
Billings	0	0	------	0	------	0	0	0	1	0	0	------
Great Falls	0	0	------	0	------	0	1	0	1	0	0	------
Helena	0	0	------	0	------	0	0	0	0	0	0	------
Missoula	0	0	------	0	2	0	0	0	0	0	0	------
Idaho:												
Boise	0	0	------	0	------	0	0	0	0	0	0	------
Colorado:												
Denver	0	0	------	0	228	1	5	0	5	0	0	8
Pueblo	0	0	------	0	22	0	1	0	14	0	0	------
Utah:												
Salt Lake City	3	0	------	0	110	0	2	0	3	0	0	1

City reports for week ended May 8, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0		0	225	0	3	0	3	0	0	4
Spokane	0	0		0	6	0	0	0	2	0	0	0
Tacoma	0	0		0	15	0	0	0	1	0	0	
California:												
Los Angeles	0	0	7	0	405	1	5	1	13	0	0	9
Sacramento	0	0		0	31	0	2	0	2	0	0	8
San Francisco	2	0	5	0	127	0	8	1	16	0	0	1
Total	44	1	51	3	8,347	26	279	10	659	0	4	226
Corresponding week, 1947[1]	60		67	19	2,112		303		666	2	14	820
Average 1943–47	66		57	[2] 16	[3] 5,914		[2] 313		1,394	1	13	668

[1] Exclusive of Oklahoma City.
[2] 3-year average, 1945–47.
[3] 5-year median, 1943–47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (latest available estimated population, 34,082,100)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Tyhpoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	20.8	0.0	3.0	0.0	1,004	8.9	53.6	0.0	265	0.0	0.0	57
Middle Atlantic	6.5	0.0	0.5	0.0	1,385	3.7	44.0	0.5	112	0.0	0.0	24
East North Central	1.2	0.6	2.4	0.0	1,313	6.1	31.0	0.0	111	0.0	0.6	29
West North Central	18.1	0.0	4.0	2.0	1,605	4.0	38.2	0.0	76	0.0	0.0	54
South Atlantic	8.2	0.0	40.9	1.6	912	0.0	63.7	1.6	64	0.0	1.6	59
East South Central	0.0	0.0	8.6	8.6	403	0.0	60.0	0.0	26	0.0	0.0	94
West South Central	5.1	0.0	12.7	0.0	721	2.5	58.4	15.2	13	0.0	5.1	10
Mountain	23.8	0.0	0.0	0.0	2,875	7.9	71.5	0.0	191	0.0	0.0	71
Pacific	3.2	0.0	10.0	0.0	1,279	1.6	28.5	3.2	59	0.0	0.0	35
Total	6.8	0.2	7.8	0.5	1,281	4.0	42.8	1.5	101	0.0	0.6	35

Anthrax.—Cases: Philadelphia 1.

Dysentery, amebic.—Cases: Buffalo 1; New York 9; Detroit 8; Memphis 1; New Orleans 3; San Antonio 2; Los Angeles 3.

Dysentery, bacillary.—Cases: Worcester 1; Los Angeles 6.

Dysentery, unspecified.—Cases: Baltimore 4; San Antonio 8.

Leprosy.—Cases: New York 1; San Francisco 1.

Typhus fever, endemic.—Cases: New York 2; New Orleans 1.

PLAGUE INFECTION IN ARIZONA AND WASHINGTON

Under date of May 11 plague infection was reported proved in ectoparasites of rodents in Arizona and Washington as follows:

Apache County.—A pool of 126 fleas from 3 ground squirrels, *Citellus variegatus* (*Otospermophilus variegatus juglans* (?)) (one found dead), taken April 27 on State Highway No. 61, 6 miles north of a location 10 miles northeast of Show Low on U. S. Highway No. 60; and a pool of 3 ticks taken from the ground squirrel found dead.

WASHINGTON

Kittitas County.—A pool of 245 fleas from 195 mice, *Microtus* (*nanus*?), trapped 18 miles east of Ellensburg on U. S. Highway No. 10.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended April 24, 1948.—During the week ended April 24, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		33		205	224	49	22	13	90	636
Diphtheria				10	1	1			1	13
Dysentery, bacillary									1	1
German measles				235	27		1	7	12	282
Influenza		26			10	9			22	67
Measles		4		1,079	1,183	2	4	26	104	2,402
Mumps		16		228	371	53	91	45	8	812
Poliomyelitis					1					1
Scarlet fever		5	2	81	91	5		4	12	200
Tuberculosis (all forms)		6	6	140	44	18	13		39	266
Typhoid and paratyphoid fever				11					2	13
Undulant fever				1	1	1		1	4	8
Venereal diseases:										
Gonorrhea		23	10	96	77	20	13	41	45	334
Syphilis		5	5	69	52	10	8	5	18	172
Whooping cough		1		69	32	5	4	26	5	142

FINLAND

Notifiable diseases—March 1948.—During the month of March 1948, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	8	Paratyphoid fever	165
Diphtheria	225	Poliomyelitis	5
Dysentery	5	Scarlet fever	343
Gonorrhea	908	Syphilis	321
Malaria	5	Typhoid fever	38

MADAGASCAR

Notifiable diseases—March 1948.—Notifiable contagious diseases were reported in Madagascar and Comoro Islands during March 1948 as follows:

Disease	March 1948			
	Aliens		Natives	
	Cases	Deaths	Cases	Deaths
Beri-beri	0	0	6	0
Bilharziasis	1	0	307	2
Cerebrospinal meningitis	0	0	8	3
Diphtheria	8	0	3	0
Dysentery, amebic	15	0	433	8
Dysentery, bacillary	5	0	1	0
Erysipelas	0	0	15	2
Influenza	10	0	2, 881	14
Leprosy	1	0	66	0
Malaria	702	3	51, 269	441
Measles	0	0	88	1
Mumps	4	0	122	0
Plague	0	0	28	23
Pneumonia, broncho	0	0	288	50
Pneumonia, pneumococcic	1	0	373	62
Poliomyelitis	0	0	2	0
Puerperal infection	0	0	7	2
Relapsing fever	1	0	0	0
Trachoma	1	0	1	0
Tuberculosis, pulmonary	7	1	191	21
Typhoid fever	3	0	43	8
Whooping cough	5	1	150	4

NORWAY

Notifiable diseases—January 1948.—During the month of January 1948, cases of certain notifiable diseases were reported in Norway as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	9	Mumps	4, 531
Diphtheria	103	Paratyphoid fever	3
Dysentery	253	Pneumonia (all forms)	3, 064
Encephalitis, epidemic	1	Poliomyelitis	10
Erysipelas	401	Rheumatic fever	179
Gastroenteritis	3, 578	Scabies	3, 604
Gonorrhea	158	Scarlet fever	288
Hepatitis, epidemic	105	Syphilis	128
Impetigo contagiosa	3. 027	Tuberculosis (all forms)	341
Influenza	4, 157	Typhoid fever	1
Laryngitis, including bronchitis	14, 678	Weil's disease	4
Measles	77	Whooping cough	447

STRAITS SETTLEMENTS

Singapore—Poliomyelitis.—Under date of May 13, 1948, 12 new cases of poliomyelitis, with 4 deaths, were reported in Singapore, bringing the total since April 17 to 33 cases and 6 deaths (12 cases, 2 deaths in adults, and 21 cases, 4 deaths in children).

VENEZUELA

Maracaibo—Poliomyelitis.—Information dated May 4, 1948, reports an outbreak of poliomyelitis in Maracaibo, with 8 cases occurring during the preceding 24 hours.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Plague

India—Calcutta.—During the week ended April 24, 1948, 73 cases of plague with 12 deaths were reported in Calcutta, India.

Smallpox

China—Shanghai.—For the week ended May 1, 1948, 92 cases of smallpox were reported in Shanghai, China.

Libya—Tripolitania.—For the week ended April 24, 1948, 129 cases of smallpox were reported in Tripolitania, Libya, including 4 cases in Tripoli, 90 in Gebel Soda, and 35 in other areas.

Peru—Lima.—Information dated May 14, 1948, states that a mild outbreak of smallpox has been reported in Lima-Callao and adjacent areas. During the month of January 12 cases were reported, 12 in February, 11 in March, and 22 in April.

DEATHS DURING WEEK ENDED MAY 8, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended May 8, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	9, 266	9, 190
Median for 3 prior years	9, 147	
Total deaths, first 19 weeks of year	188, 841	189, 114
Deaths under 1 year of age	655	769
Median for 3 prior years	619	
Deaths under 1 year of age, first 19 weeks of year	13, 072	15, 064
Data from industrial insurance companies:		
Policies in force	71, 061, 430	67, 282, 120
Number of death claims	12, 507	14, 611
Death claims per 1,000 policies in force, annual rate	9. 2	11. 3
Death claims per 1,000 policies, first 19 weeks of year, annual rate	10. 1	10. 1

×

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. : 1948
For sale by the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C.
Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 JUNE 11, 1948 NUMBER 24

IN THIS ISSUE

Nutrition Studies

Rats and Typhus Fever in Texas

Studies of Acute Diarrheal Diseases—Shigellosis

FEDERAL SECURITY AGENCY

PUBLIC HEALTH SERVICE

FEDERAL SECURITY AGENCY
Oscar R. Ewing, Administrator

PUBLIC HEALTH SERVICE
Leonard A. Scheele, Surgeon General

Division of Public Health Methods
G. St. J. Perrott, Chief of Division

CONTENTS

Page

Nutrition studies. II. Methods of collecting dietary data. Miriam G. Eads and Alla P. Meredith 777

Observations on rats and typhus fever in San Antonio, Texas. David E. Davis 783

Studies of the acute diarrheal diseases. XX. Further observations of chemotherapy in shigellosis; the efficacy of streptomycin and sulfacarzole. Albert V. Hardy and Seymour P. Halbert 790

INCIDENCE OF DISEASE

United States:

- Reports from States for week ended May 22, 1948, and comparison with former years 793
- Weekly reports from cities:
  - City reports for week ended May 15, 1948 797
  - Rates, by geographic divisions, for a group of selected cities 799
- Plague infection in Guadalupe County, New Mexico 800
- Territories and possessions:
  - Puerto Rico—Notifiable diseases—4 weeks ended May 1, 1948 800

Deaths during week ended May 15, 1948 800

Foreign reports:

- Canada—Provinces—Communicable diseases—Week ended May 1, 1948 801
- Cuba—
  - Habana—Communicable diseases—4 weeks ended May 1, 1948 801
  - Provinces—Notifiable diseases—4 weeks ended May 1, 1948 801
- New Zealand—Notifiable diseases—5 weeks ended May 1, 1948 802
- Straits Settlements—Singapore—Poliomyelitis 802
- Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—
  - Cholera 802
  - Plague 802
  - Smallpox 803
  - Typhus fever 803

Public Health Reports

Vol. 63 • JUNE 11, 1948 • *No. 24*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

NUTRITION STUDIES[1]

II. METHODS OF COLLECTING DIETARY DATA[2]

By MIRIAM G. EADS, and ALLA P. MEREDITH, *Nutrition Consultants, Nutrition Section, Public Health Service*

This is the second of a series of reports relating to the methods employed in evaluating human nutrition on a public-health scale. This report deals with the techniques of accumulating dietary data and the conditions under which each method can be used most satisfactorily.

PURPOSE OF COLLECTING DIETARY DATA

Information about dietary practices of an individual or group is essential in nutrition appraisal studies. Although dietary information alone cannot be used as a means of assessing nutritional status, knowledge of the diet pattern of an individual or group, when studied in relation to biochemical and physical findings, makes a definite contribution to the study of nutritional status.

Dietary appraisal methods have been developed that can (1) be adapted to various groups and conditions met in public-health nutrition work and (2) be applied by health departments in developing nutrition programs. The methods used are as simple as they can be made without sacrifice of accuracy.

The one-day diary type diet record was chosen in preference to either the memory record, or the diet history. It has been found that there will be more accurate recording and description of the amounts of foods eaten if the record is made immediately after the meal. Since there is no indication that significant numbers of people modify their diets on the day the record is kept, this type is believed to be more accurate than a memory record.

---

[1] From the Nutrition Section, States Relations Division.

[2] The authors express their appreciation to the unit nutritionists and others who have cooperated in developing the methods here presented.

Nutritionists recognize that one day's food intake may not be typical for the individual, but they believe that carefully taken one-day diary records for large groups provide important information about the diet pattern of the group as a whole. Interest is maintained over a short period and people make a real effort to keep accurate records for one day. They tend to lose interest and become careless, however, when they attempt to keep records for several days. Interest can be extended so that such records may be made several times to obtain seasonal and economic variations. By repeating one-day diary records over a period of time, more information about dietary habits probably can be obtained than by using seven-day records taken at any one season or on a much smaller number of individuals.

The three steps to be taken in obtaining a diet record are:

1. Explain the purpose for which the record is to be used; (a) that it is a part of a study of the food habits of the community, and that a large number of people are being asked to participate, (b) that the physician and nutritionist may give helpful suggestions on the participant's own diet.

2. Explain that a record must include only what the person eats on one particular day—not what he "usually" eats.

3. Avoid surprise, approval or disapproval of the person's diet while taking the record. This is especially important in working with children, and particularly when the work is done in the classroom. In studies of children, it has been found advisable to secure records from those in the fourth grade of school and above. Younger children are often unable to report completely or accurately the foods eaten.

The interviewer who develops the proper rapport usually gets accurate records. Care must be taken against inadvertently letting preconceived ideas of foods that belong in certain meals influence the response of the person being interviewed.

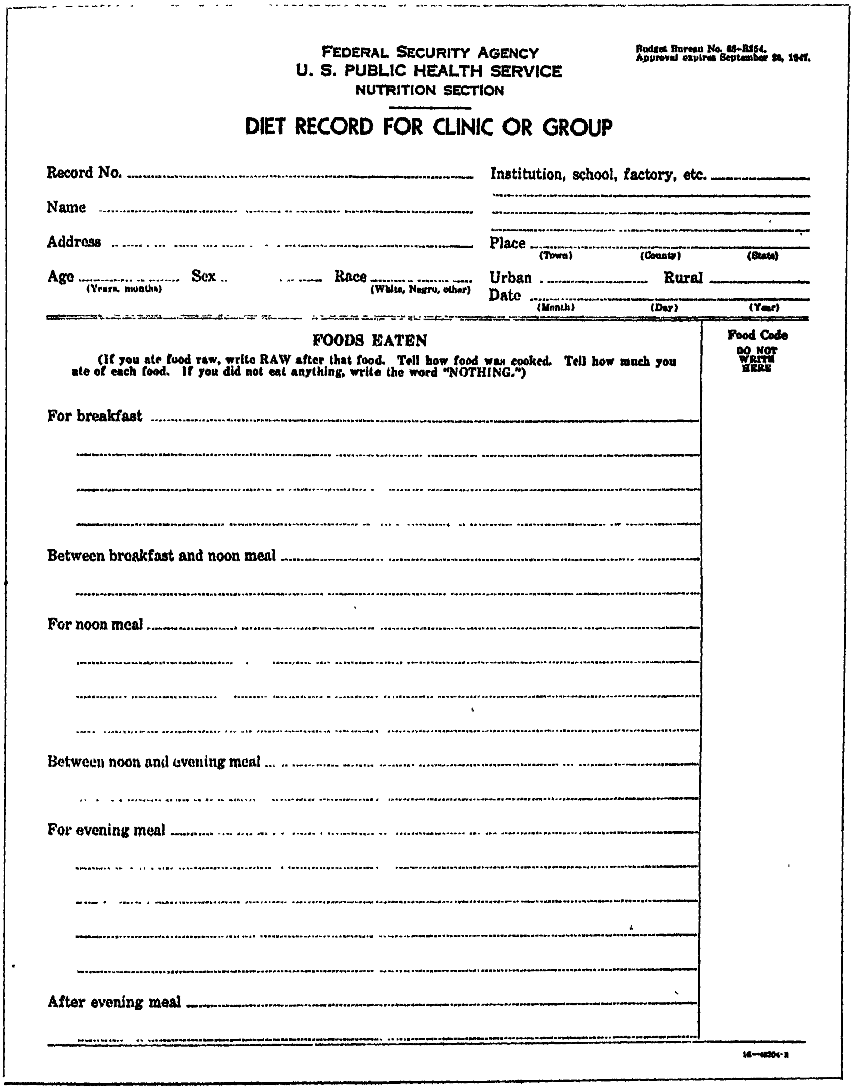
Dishes of various sizes and shapes and food models help the person to estimate the quantities of food eaten. All dishes displayed during the interview are marked to indicate capacity in terms of a standard measure.

The accuracy of the diet records obtained in a survey are dependent upon (1) ability to make people understand exactly what is wanted and (2) open-mindedness and patience in probing for information.

METHODS OF COLLECTING DIETARY DATA

Diet records are taken in connection with two types of nutrition appraisal studies for qualitative and quantitative evaluation; the group method is used in rapid surveys, and individual methods are used for detailed studies.

The record form (fig. 1) provides space for recording each meal, food eaten between meals and dietary supplements.



Budget Bureau No. 68-R354.
Approval expires September 30, 1947.

FEDERAL SECURITY AGENCY
U. S. PUBLIC HEALTH SERVICE
NUTRITION SECTION

DIET RECORD FOR CLINIC OR GROUP

Record No. ....
Institution, school, factory, etc. ....
Name ....
Address ....
Place .... (Town) (County) (State)
Age .... (Years, months) Sex .... Race .... (White, Negro, other)
Urban .... Rural ....
Date .... (Month) (Day) (Year)

FOODS EATEN

(If you ate food raw, write RAW after that food. Tell how food was cooked. Tell how much you ate of each food. If you did not eat anything, write the word "NOTHING.")

Food Code
DO NOT WRITE HERE

For breakfast ....

Between breakfast and noon meal ....

For noon meal ....

Between noon and evening meal ....

For evening meal ....

After evening meal ....

[illegible]

FIGURE 1.

Group Methods

The nutritionist discusses with the group the purpose of the one-day diary record and provides each individual with a copy of the following instructions (fig. 2) for recording the diet. The group reviews the instructions to clarify any questions about procedure.

PUBLIC HEALTH SERVICE — NUTRITION SECTION

INSTRUCTIONS TO THE PERSON RECORDING HIS DIET

When you write your diet record

REMEMBER THESE THINGS

1. WRITE DOWN EVERY THING YOU EAT OR DRINK. If you miss a meal, write "NOTHING" in the space for that meal.
2. TELL HOW FOOD IS COOKED. IF YOU EAT A FOOD RAW, WRITE "RAW" AFTER IT.
3. WHEN YOU EAT TWO FOODS TOGETHER, WRITE DOWN BOTH OF THEM—like this:

   1 white roll with jelly
   1 cup black coffee with 1 teaspoon sugar
4. WRITE DOWN HOW MUCH YOU EAT OF EACH FOOD. Tell how many teaspoonfuls or tablespoonfuls you eat; tell whether you eat ¼ or ½ or 1 cup full.
5. BE SURE TO WRITE THE *KIND* OF FOOD YOU EAT. If you eat cereal, write cornflakes, or grits, or oatmeal, or whatever kind of cereal it is. BE SURE TO TELL THE *KIND* if you eat any of these foods: bread, meat, peas, beans, potatoes, soups, salads, or sandwiches.

AFTER YOU FINISH WRITING YOUR RECORD, SEE IF YOU DID THESE THINGS:

1. Did you write down *EVERYTHING* you ate or drank?
2. Did you write down *HOW MUCH* you ate or drank?
3. Did you miss a meal? If you did, write *NOTHING* in the space for that meal. If you didn't eat between meals, write *NOTHING* in the space for between-meal food.

FIGURE 2

Each individual begins by listing the foods eaten at the previous meal. The nutritionist checks some of the records to determine if the required information as to the kind of food, size of portion, and method of preparation, is recorded.

The two subsequent meals, as well as all foods consumed between meals and dietary supplements, are recorded after each meal independently by each member of the group. Instructions for completing the record emphasize that everything put into the mouth and swallowed within the 24-hour period must be recorded. The records are examined briefly for completeness and accuracy when collected by the nutritionist. The information secured by the group method provides insight into possible dietary problems on which a nutrition and health education program in a community can be developed.

Individual Methods

1. The individual method is used in collecting dietary data from persons who have not received previous instructions. The person tells the interviewer what he ate at his most recent meal. The interviewer records not only the food eaten, but also the quantity and method of preparation. At least two interviews with the individual to secure the food intake over a 24-hour period are required. Considered more accurate than the group method, the individual method is used in intensive studies and in instances where dietary records are calculated for essential nutrients.

2. In family studies, individual instructions are given to one member of the family, usually the mother. A nutritionist, or more often a nurse who has received instructions from the nutritionist in the method of taking diet records, makes home visits to invite the family to attend the nutrition clinic. During the visit the purpose of the record is explained. One member of the family is taught how to keep the records. This is done by listing the food the person has eaten at the previous meal.

A copy of the instructions (fig. 2) is left with the family. The completed diet records for all members of the family are brought to the clinic.

The nutritionist reviews the records at the clinic and checks them for completeness of information. Food models, bowls, cups, spoons and glasses are again useful for determining size of portions.

This method is used for family studies and for intensive work with individuals, particularly when a special problem is considered or more detailed information is desired on food habits.

3. A modification of the group and the individual methods are used for more detailed or intensive study of groups. After initial group instruction in keeping of records, the nutritionist interviews each individual to find, as accurately as possible, the kind and quantities of food eaten and method of preparation. This requires two, and possibly three, interviews with each individual, depending on the age levels in the group. The methods and techniques used in the interview are similar to those previously discussed.

The modified method is suitable for collecting dietary information in large scale therapeutic testing, feeding demonstrations, large population studies, or intensive education programs in a community, factory, or school.

In all methods of securing dietary records the nutritionist questions the person to learn whether the record is typical, and to secure any other information that may be pertinent to the diet history. The interview provides an opportunity for the nutritionist to make recommendations to the individual for improving his diet. If the mother of a family is being interviewed, she is given suggestions for improving the diet of the family. The suggested dietary pattern of the National Research Council is used as a guide. Suggestions are kept within the limits of foods available to the person interviewed and his ability to follow suggestions.

At the interview, completed diet records are qualitatively scored by the nutritionist for the presence of the foods that fall into the following groups: green and yellow vegetables; foods rich in vitamin C; other fruits and vegetables; milk; meat, fish or fowl; cheese and eggs; dried legumes and nuts; whole grain products; enriched cereal products; butter and fortified fats.

The dietary evaluation is based on the people studied as a group, and the dietary pattern is determined. The data are expressed as the percent of the people being studied who ate foods included in the above groups. The one-day diary records may also be used for quantitative evaluation of essential nutrients, particularly when intensive studies are being conducted. In both the qualitative and quantitative assessment of the diet the results are compared with the clinical and laboratory findings.

The methods that are presented here are adaptations of methods that have been used by other nutrition workers in various types of nutrition studies. They have been modified and further developed during the course of continuing nutrition appraisal field studies conducted by the Nutrition Section of the States Relations Division of the Public Health Service.

OBSERVATIONS ON RATS AND TYPHUS FEVER IN SAN ANTONIO, TEX.

By DAVID E. DAVIS [1]

INTRODUCTION

Murine typhus fever is a disease of persons caused by rickettsiae, which are transmitted among rats and persons by fleas and occasionally among other ectoparasites and mammals. The complicated series of interactions between etiological agent and hosts responds to seasonal cycles and variations of ecological factors, especially weather.

This paper describes the characteristics of the rats involved in typhus fever, based upon 16 months of observations in San Antonio, Texas. Although the studies were made for a short period of time and in only one place, similar studies in other areas can eventually form a firm foundation for understanding the nature of the interrelations which result in the appearance of the disease in humans.

Climate of locality.—The observations were obtained in the city of San Antonio, Texas, which lies at 29.50° north latitude and 97.50° west longitude. The climate is classed as humid subtropical, but actually is a transition from this type to low-altitude dry-climate type (Trewartha, 1937). The average annual rainfall is 26.86 inches (68.4 cm.) and the average annual temperature is 69° F. (20.1° C.) according to the records of the U. S. Weather Bureau at San Antonio based on observations for 56 years.

The hythergraph (figure 1) shows the monthly average rainfall and temperature for 1885–1940 and the monthly averages during the period of these observations, May 1944 to September 1945. The climate is characterized by mild winters, rainy springs, dry summers, and rainy falls. The hythergraph for 1944–45 shows the great variation which may occur from one season to another.

The hythergraph from May 1944 to September 1945 is the basis for division of the year into six seasons: May and June 1944 (*vernal season*); July and August (*estival season*); September and October (*serotinal season*); November (*autumnal season*); December, January, and February (*hibernal season*); March and April (*prevernal season*); May and June 1945 (*vernal season* of 1945): July and August (*estival season* of 1945). From the hythergraph it is seen that the *vernal* and *serotinal seasons* are warm and wet, the *estival season* is hot and dry, and the *prevernal*, *autumnal*, and *hibernal seasons* are cool and fairly dry. The characteristics of rats are discussed from the viewpoint of these six seasons.

---

[1] Now at The John Hopkins School of Hygiene and Public Health. Formerly S. A. Sanitarian (R), Public Health Service.

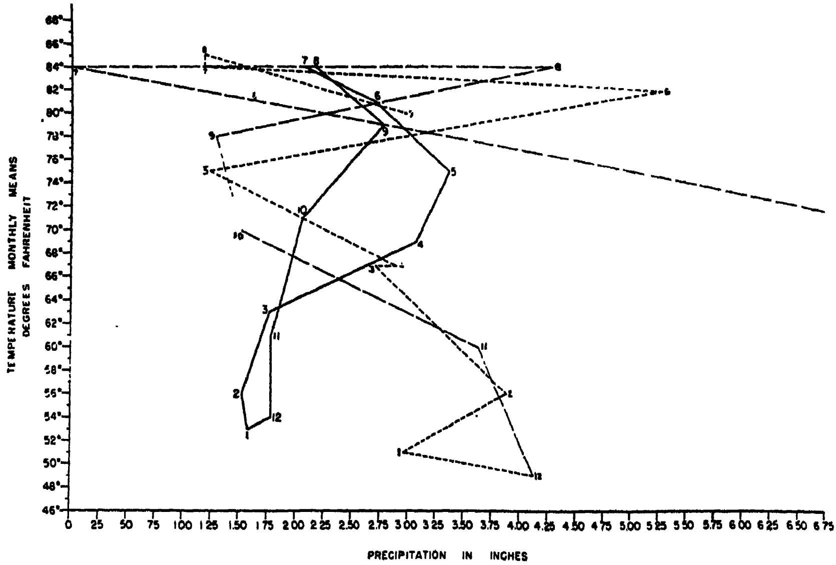


Figure 1.—Hythergraph for San Antonio, Texas. The solid line shows the monthly means for 55 years (1885–1940); the dashed line, — —, the monthly means for May–December 1944; and the dashed line ...., those for January–September 1945. The numbers indicate the months.

OBSERVATIONS ON COMMENSAL RATS

Both species of commensal rats (*Rattus rattus* and *Rattus norvegicus*) occur in San Antonio in about equal numbers although the relative abundance differs greatly in various parts of the city. The two species of rats appear to live apart from one another with little actual conflict, and when both species occur in the same building, they seldom occupy the same ecological niches.

Since the roof rat (*R. rattus*) in San Antonio is represented by individuals approximating in color any of the so-called subspecies, *frugivorus*, *rattus*, and *alexandrinus*, and since many intergrades of all three forms have been found, subspecies are not considered further and all rats of this species will be called roof rats (*R. rattus*).

The size (length of head plus body) of both species is shown in table 1. Adult and subadult males of both species average longer than the females. The difference in size between sexes is not significant for young roof rats but is significantly in favor of females for young brown rats. Several interpretations of the latter difference are possible. Perhaps the young females do not travel around until they are larger than the males. Perhaps the time required to reach subadult age (reproductive condition) is greater for females than for males.

The breeding season of rats is of fundamental importance in the natural history of typhus fever. Just before the breeding season, some kinds of rodents move longer distances (Warwick, 1940; Evans, 1942) and during the breeding season a new supply of young susceptible rats is added to the population. Thus a disease may be spread into uninfected areas and may infect non-immune rats.

TABLE 1.—*Head-body length, sex ratio, and age classes of rats*

Age	Sex	Number of rats	Arithmetic mean	Standard deviation	Rats	Percent male	Percent of rats
ROOF RATS							
Adult	Male	317	177.7	[1] 14.2	846	[2] 42.5	38.3
	Female	378	172.8	14.2			
Subadult	Male	148	162.8	[1] 12.6	327	[2] 57.8	14.3
	Female	133	157.3	15.4			
Young	Male	414	122.6	18.5	1,038	50.1	47.4
	Female	369	123.1	20.9			
BROWN RATS							
Adult	Male	293	214.3	[1] 17.1	791	52.8	57.2
	Female	260	201.9	18.9			
Subadult	Male	69	181.0	[1] 13.7	166	51.2	12.0
	Female	58	176.9	15.0			
Young	Male	123	128.3	[1] 25.3	427	47.5	30.8
	Female	147	141.1	22.0			

[1] The differences between sexes are statistically significant at the 0.05 level.
[2] Departure from 50 percent significant at 1 percent level.

The age classes for this study are based upon the reproductive condition, not upon size of body or ossification of the skull, because the important aspect from the ecological and epidemiological viewpoint is whether the rat is reproductively mature. Thus three age groups are distinguished. The young rats have small testes and seminal vesicles or infantile ovaries and threadlike oviducts. The subadult male rats have medium sized testes with obvious spermatic artery and seminal vesicles about ½ cm. long. The subadult female rats have follicles in the ovary and wide white oviducts. The adult male rats have mature testes and large convoluted vesicles. The adult female rats have old corpora lutea and placental scars or are pregnant.

The percentages of rats in each age class are shown by seasons in figure 2. It is not known how much the relative percentages are influenced by the type of traps or the type of poison, but proportions are believed to be comparable from month to month. The presence of young rats in all seasons indicates that young are produced in any season of the year, and the high percentage of young rats in serotinal and autumnal seasons and then again in the vernal season suggests two peaks in the breeding season. The breeding season is also indicated by the high percentage of pregnant females in the vernal season.

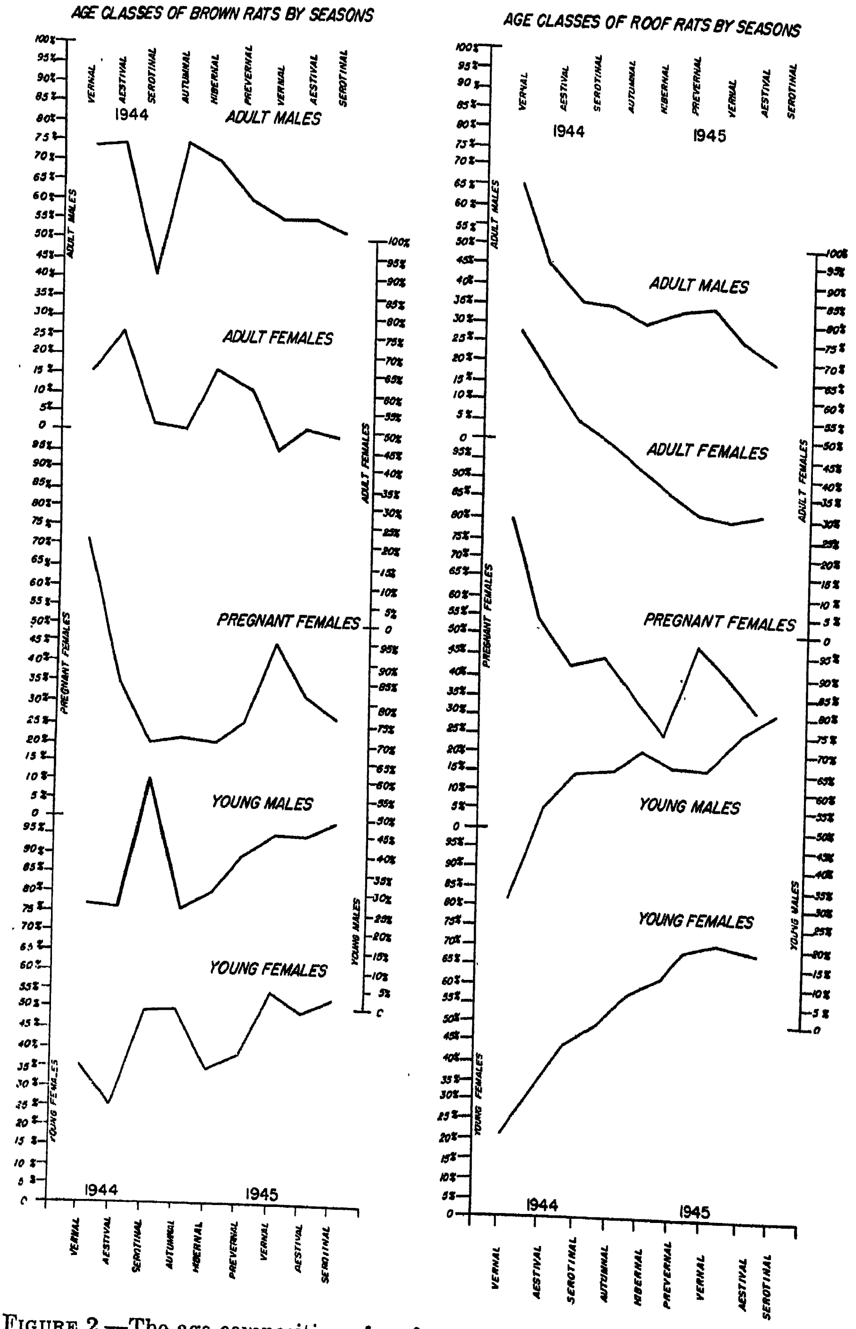


FIGURE 2.—The age composition of roof rats and brown rats and the percent of adult females which were pregnant according to seasons.

Buxton (1936) in a summary of available information concerning breeding seasons of rats throughout the world finds that the maximum breeding season appears to coincide with the warm season in temperate and subtemperate climates but that reproduction occurs throughout the year. The data for San Antonio show no marked breeding season, although there is some seasonal variation and apparently a maximum for both species in the vernal season. It is possible that the persistent breeding found in these rats is due to the fact that almost all the rats examined came from inside buildings where food is ample and climatic changes are minimized. In contrast, roof rats caught primarily in barns and corn cribs in a nearby county showed a seasonal change in breeding (Davis, 1947). In England, Perry (1945) found continuous breeding of outdoor brown rats with a peak in April and May, and an unexplained peak in January.

TABLE 2.—*Size of female rats and number of embryos*

Size in mm.[1]	Rats examined		Percent pregnant		Number of embryos		Arithmetic mean	
	Roof	Brown	Roof	Brown	Roof	Brown	Roof	Brown
120–129	70	....	0	....	....	....	....	....
130–139	94	....	1	....	5	....	5.0	....
140–149	97	26	2	0	14	....	7.0	....
150–159	105	28	12	7	82	11	6.4	5.5
160–169	209	34	15	6	212	15	6.8	7.5
170–179	152	31	32	32	362	72	7.4	7.2
180–189	99	69	40	20	302	108	7.5	7.7
190–199	39	54	31	20	91	88	7.6	8.0
200–209	9	53	44	40	34	171	8.5	8.1
210–219	2	51	100	34	11	126	5.5	7.4
220–229	2	20	0	20	....	42	....	8.4
230–239	0	14	....	14	....	20	....	10.0
240–249	....	7	....	14	....	1	....	1.0
250–259	....	0	....	....	....	....	....	....
Total	878	387	....	....	1,113	674	7.2	7.9

[1] Measurement of head plus body.

The size at which females bear young is shown in table 2. Only a few roof rats breed at a length of less than 150 mm. (head plus body length) and only a few brown rats at a length of less than 170 mm. The length at which 50 percent of the roof rats and of the brown rats are parous is 163 mm. and 178 mm., respectively (Davis and Emlen, 1948). It should be noted that although the modal class for roof rats is 160–169 mm., the highest percent of pregnancies occurred in the class 180–189 mm. (except the small number of rats in larger classes). Similarly for brown rats the modal class is 180–189 mm. and the highest percent of pregnancies occurred in the class 200–209.

The number of embryos in roof rats averages 7.2 per female and tends to increase in larger females (correlation coefficient is +.237).

The equation for the regression line is $y = 175.7 + .16x$ where y is the length size of the rat in mm. and x is the number of visible embryos. The number of embryos in brown rats averages 7.9 and also increases somewhat with size (correlation coefficient is +.113 when largest rat is excluded). The regression line is $y = 200.5 + .095x$. Since King (1924) found that the second litter in an albino rat is the largest and that subsequent litters decline in size, the observed increase in litter size may be interpreted as indicating that few of these rats had produced many litters, or that sociological factors favor larger females.

The sex ratios of rats caught or poisoned are shown in table 1. For roof rats, a significant difference in favor of females occurs in adults, and in favor of males in subadults. Several interpretations are possible. Females may live longer than males, or be easier to capture and poison, or require more time to reach subadult age. The sex differences in brown rats are not significantly different from 50 percent but show an increase in males with age. The sex ratio of the two species differ in the direction of change of sex ratio with age. The percent of male roof rats is lower in adults than in young, but the percent of male brown rats is higher in adults than in young. Buxton (1936) summarized the available information on sex ratios and found great variation from place to place. However, he usually found a ratio in favor of females.

The ratios of age classes are given in table 1. The percent of young in the roof rats was much greater than in brown rats. These results could mean that brown rats live longer than roof rats or that young roof rats are relatively easier to catch than young brown rats.

ANTIBODIES FOR MURINE TYPHUS FEVER

The occurrence of typhus fever in rats can be determined by testing the blood for complement fixing antibodies (Bengston and Topping,

TABLE 3.—*Presence of antibodies in rats*

Type	Total rats examined	Percent positive	Type	Total rats examined	Percent positive
ROOF RATS			BROWN RATS		
Adults	265	34.7	Adults	379	51.4
Male	107	[1] 42.0	Male	187	49.2
Female	158	[1] 29.8	Female	192	53.7
Subadults	117	24.8	Subadults	87	32.2
Male	59	20.2	Male	41	36.8
Female	58	29.2	Female	46	28.2
Young	173	9.7	Young	138	31.2
Male	78	10.2	Male	62	25.8
Female	95	8.4	Female	76	35.6

[1] The sex difference in percent positive for adult roof rats is statistically significant at the 5 percent level.

1941). The percentages of positive tests for all rats (table 3) show that the sex differences are not significant except for adult roof rats. However, since this is the only one of six differences it should not be regarded as established. A comparison of the two species shows a significant difference between the adults and between the young but not between the subadults. Since all differences are in the same direction, these data probably indicate that a higher percentage of brown rats than roof rats has typhus complement fixing antibodies.

Because of population and environmental differences in various types of buildings, it is of interest to compare the percent of positive rats in residences, stores, and grain mills. An analysis of the differences by the x^2 test shows that there are no sex differences but that there are locality differences, that grain mills have more positive rats than either residences or stores, and that these latter two are about the same. When the stores are further subdivided into groceries, cafes, nonfood, and miscellaneous, the rats from groceries and cafes are about equal but the nonfood establishments show a surprisingly high number of positive rats. Rats caught at places suspected to be the source of human cases of typhus naturally show high percentages.

SUMMARY

This paper describes investigations of the life histories of rats and their relation to typhus fever. The observations were made in San Antonio, Texas, which has a humid subtropical climate divided into six biological seasons.

Roof rats (*Rattus rattus*) and brown rats (*R. norvegicus*) are present in the city in about equal numbers. The head plus body length of adult roof rats was significantly larger for males (177.7 mm.) than for females (172.8) and similarly of brown rats was significantly larger for males (214.3 mm.) than for females (201.9 mm.). Reproduction as determined by pregnancy rates and by age ratios occurs throughout the year and has a maximum in the vernal season (May–June). The average number of visible embryos per female was 7.2 for roof rats and 7.9 for brown rats. The sex ratio of trapped or poisoned adult roof rats is significantly in favor of females. The sex ratios of such brown rats is not significantly different from 50 percent. The percent of roof rats which are young is greater than the percent of brown rats.

Of adult roof rats, 34.7 percent were positive for typhus complement fixing antibodies, and 51.4 percent of the adult brown rats were positive (significant difference). The differences between sexes in presence of antibodies for typhus are not significant except for adult roof rats (in favor of males). An analysis of presence of antibodies for

typhus shows that grain mills had a significantly higher percent positive than stores or residences, which were about equal.

REFERENCES

(*1*) Bengston, I. and Topping, N. H.: The specificity of complement fixation test in endemic typhus fever using a rickettsiae antigen. Pub. Health Rep. **56**:1723–1727 (1941).
(*2*) Buxton, P. A.: Breeding rates of domestic rats trapped in Lagos, Nigeria, and certain other countries. J. Anim. Ecol. **5**:53–66 (1936).
(*3*) Davis, David E.: Notes on commensal rats in Lavaca County, Texas. J. Mamm. **28**:241–244 (1947).
(*4*) Davis, David E. and Emlen, J. T., Jr. 1948: The placental scar as a measure of fertility in rats. J. Wildlife Manag. May, 1948.
(*5*) Evans, F. C.: Studies of a small mammal population in Bagley Wood, Berkshire. J. Anim. Ecol. **11**:182–197 (1942).
(*6*) King, H. D.: Litter production and the sex ratio in various strains of rats. Anat. Rec. **27**:337–366 (1924).
(*7*) Perry, J. S.: The reproduction of the wild brown rat. (*Rattus norvegicus* Erxleben). Proc. Zool. Soc., London **115**:19–46 (1945).
(*8*) Trewartha, G. T.: An introduction to weather and climate. McGraw-Hill, pp. 373 (1937).
(*9*) Warwick, T.: A contribution to the ecology of the muskrat (*Ondatra zibethica*) in the British Isles. Proc. Zool. Soc., London, Series A. **110**:165–201 (1940).

STUDIES OF THE ACUTE DIARRHEAL DISEASES

XX. FURTHER OBSERVATIONS OF CHEMOTHERAPY IN SHIGELLOSIS; THE EFFICACY OF STREPTOMYCIN AND SULFACARZOLE

By ALBERT V. HARDY,[2] *Director, Bureau of Laboratories, Florida State Board of Health*, and SEYMOUR P. HALBERT, *Assistant Surgeon (R) Public Health Service*

The relative efficacy of sulfonamides as observed in the treatment of 2,257 individuals with proved *Shigella* infection has been reported in preceding papers of this series (*1, 2, 3, 4, 5*). More recently, we examined the response to streptomycin and to sulfacarzole, a poorly absorbed sulfonamide (*6*). The findings are stated as a brief supplement to preceding publications.

The patients were all inmates of an institution for the mentally defective in New York State. They ranged in age principally from 5 to 15 years, and almost all were male. The streptomycin was given by mouth, four doses daily. Sweetened milk was a satisfactory vehicle. Treatment was limited to a 3-day period. Three million units of streptomycin were given to each of 20 cases, and 6 million

---

[1] From the Division of Infectious Diseases, National Institute of Health, with the cooperation of the New York State Department of Mental Hygiene. The work described in this paper was done under a transfer of funds recommended by the Committee on Medical Research, from the Office of Scientific Research and Development to the National Institute of Health.

[2] Formerly, Surgeon (R) Public Health Service.

to each of the other 17 cases. The sulfacarzole, 8 grams daily, was administered in 4 doses, and was continued for 4 days. Sulfadiazine, 4 grams daily to children, was used similarly. All under treatment were cultured daily. The findings, summarized as in preceding papers, are shown in tables 1 and 2. All infections in this series were due to *Shigella* (Flexner type Z.)

TABLE 1.—*Average colony counts per S. S. agar plate before, during, and following chemotherapy*

Chemotherapeutic agent	Number treated	Average colony count by days after beginning treatment							
		0[1]	1	2	3	4	5	6	7
Streptomycin	37	454	122	8	18	25	(2)	0	0
Sulfacarzole	10	450	392	68	44	(2)	8	(2)	0
Sulfadiazine	10	418	18	1	0	0	0	0	0
Untreated	10	500	271	385	275	325	325	17	107

[1] Day on which treatment started.
[2] Less than .5.

TABLE 2—*Percentage of persons with persisting positive cultures during and following chemotherapy*

Chemotherapeutic agent	Number treated	Percentage with persisting positive cultures by days after beginning treatment								
		0[1]	1	2	3	4	5	6	7	14
Streptomycin	37	100	81	41	16	8	3	0	0	16
Sulfacarazole	10	100	100	100	40	20	10	10	10	10
Sulfadiazine	10	100	60	20	0	0	0	0	0	0
Untreated	10	100	100	100	100	90	90	70	70	30

[1] Day on which treatment started.

The *Shigellae* rapidly decreased in number in the patients under streptomycin therapy. All cultures were negative for pathogens on the sixth day following the beginning of treatment. They continued so for 3 days, but by the fourteenth day, 6 of the 37 patients had had a recurrence of positive cultures. In the following week, two additional recurrences were observed. The larger dosage did not reduce this tendency of the infection to recur.

It was clearly apparent from examination of the culture specimens, that streptomycin given orally had a profound effect on the intestinal flora. The nonpathogens as well as the *Shigellae* rapidly decreased in number during therapy. The findings are analogous to the observations of Smith and Robinson (7), who quantitatively demonstrated a pronounced reduction in the intestinal bacterial flora of mice given streptomycin by the oral route.

Cases due to sulfonamide-resistant strains of *Shigella* were included among those treated with streptomycin. The sulfonamide resistance was ascertained on the basis of both clinical and *in vitro* observations. These infections responded just as readily to the streptomycin as did those caused by sulfonamide-sensitive strains. It may be recorded here, incidentally, that no significant toxic reactions to the streptomycin were noted. This is in agreement with the work of Zintel *et al.* (*8*) and others, who have shown that streptomycin is very poorly absorbed from the intestinal tract and, therefore, is essentially nontoxic by this route.

Sulfacarzole, a poorly absorbed sulfonamide, had the weakness of other products of this type. The response was slow. One case failed to become negative.

As in preceding studies, the reaction to sulfadiazine was very satisfactory. Here the colony counts declined rapidly during the first 24 hours of treatment. All cases were negative by the third day and there were no recurrences.

Ten untreated cases were followed with findings as shown in the tables.

Streptomycin may be considered, therefore, for *Shigella* infections which are resistant to sulfonamides. Probably the frequency of recurrences would be decreased by prolonging the period of treatment. We have no data on the development of resistance to streptomycin.

Sulfadiazine was substantially more effective than the poorly absorbed compound sulfacarzole.

REFERENCES

(*1*) Hardy, A. V.; Burns, W.; and DeCapito, T.: Studies of the acute diarrheal diseases. X A. Cultural observations on the relative efficacy of sulfonamides in *Shigella dysenteriae* infections. Pub. Health Rep., **58**: 689–693 (1943).

(*2*) Hardy, A. V., and Cummins, S. D.: Studies of the acute diarrheal diseases. X B. A preliminary note on the clinical response to sulfadiazine therapy. Pub. Health Rep., **58**: 693–696 (1943).

(*3*) Hardy, A. V.: Studies of the acute diarrheal diseases. X C. Further cultural observations on the relative efficacy of sulfonamides in *Shigella* infections. Pub. Health Rep., **60**: 1037–1042 (1945).

(*4*) Watt, J., and Cummins, S. D.: Studies of the acute diarrheal diseases. X D. Further studies on the relative efficacy of sulfonamides in shigellosis. Pub. Health Rep., **60**: 1355–1361 (1945).

(*5*) Hardy, A. V.: Studies of the acute diarrheal diseases, XVII. The sulfonamides in shigellosis. Pub. Health Rep. **61**: 857–866 (1946).

(*6*) Winnek, P. S.: An intestinal antiseptic: 2-sulfanilamido-5-carboxythiazole. Science **103**: 719–720 (1946).

(*7*) Smith, D. G., and Robinson, H. J.: The influence of streptomycin and streptothricin on the intestinal flora of mice. J. Bact. **50**: 613–621 (1945).

(*8*) Zintel, H. A.; Flippin, H. F.; Nichols, A. C.; Wiley, M. M.; and Rhoads, J. E.: Studies on streptomycin in man. I. Absorption, distribution, excretion and toxicity. Am. J. Med. Sciences **210**: 421–430 (1945).

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED MAY 22, 1948

Summary

A total of 127 cases of poliomyelitis was reported, in 25 States, as compared with 142 last week and a 5-year (1943–47) median of 38. The 8 States reporting more than 3 cases each (last week's figures in parentheses) are as follows: *Increases*—Iowa 5 (0), Nebraska 9 (0), Georgia 4 (0), Florida 5 (1), California 24 (21); *decreases*—New Jersey 4 (7), North Carolina 13 (18), Texas 39 (60). Only 4 States have reported more than 10 cases since May 1, as follows (last year's corresponding figures in parentheses): New Jersey 13 (1), North Carolina 39 (1), Texas 135 (7), California 59 (32). The total reported since March 20 (approximate average date of low seasonal incidence) is 590, as compared with a 5-year median of 268, reported for the corresponding period last year.

The incidence of measles again increased, from 28,895 last week to a total for the current week of 29,319, as compared with a 5-year median of 22,881. The largest increases, aggregating 2,034 cases, were reported in Massachusetts, New Jersey, Pennsylvania, Virginia, Florida, Colorado, and Utah. In only 2 of the past 12 years has the peak of reported incidence occurred as late as the current week. The total for the year to date is 393,154, as compared with a 5-year median for the period of 396,365.

Of the total of 23 cases of Rocky Mountain spotted fever (last week 8, 5-year median 10) 10 were reported in the South Atlantic area, 8 in the Mountain area, 2 in Tennessee, and 1 each in Pennsylvania, Indiana, and Oklahoma. The total to date is 52, as compared with a 5-year median of 46, reported for the period last year.

New Jersey reported 2 cases of anthrax, Alabama 1 case of smallpox, and Texas 1 case of leprosy.

A total of 8,744 deaths was recorded during the week in 93 large cities in the United States, as compared with 9,388 last week, 8,923 and 8,878, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 8,923. The cumulative figure is 206,973, as compared with 207,368 for the corresponding period last year. Infant deaths totaled 587, as compared with 743 last week and 638 for the 3-year median. The total to date is 14,402, as compared with 16,539 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended May 22, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47
	May 22, 1948	May 17, 1947		May 22, 1948	May 17, 1947		May 22, 1948	May 17, 1947		May 22, 1949	May 17, 1947	
NEW ENGLAND												
Maine	3	2	1	------	------	------	22	146	146	0	1	0
New Hampshire	0	0	0	------	------	------	59	4	20	0	0	0
Vermont	0	0	0	------	------	------	22	158	83	0	1	0
Massachusetts	5	8	5	------	------	------	1,610	490	944	2	0	3
Rhode Island	0	0	0	------	------	------	21	243	44	0	2	1
Connecticut	1	0	1	------	2	2	104	955	438	0	1	2
MIDDLE ATLANTIC												
New York	8	14	14	[1] 4	[1] 2	[1] 3	3,055	671	1,316	5	9	26
New Jersey	1	10	2	4	3	5	2,871	577	1,261	1	1	10
Pennsylvania	13	23	11	(2)	(2)	[2] 1	2,533	286	675	3	5	11
EAST NORTH CENTRAL												
Ohio	15	7	7	1	10	10	1,038	834	727	4	7	13
Indiana	14	5	3	1	------	6	722	131	131	0	2	3
Illinois	4	3	11	4	1	4	1,008	227	530	7	5	14
Michigan [3]	2	5	6	------	------	2	1,782	112	661	5	4	8
Wisconsin	1	1	3	2	20	31	1,859	680	2,271	8	2	4
WEST NORTH CENTRAL												
Minnesota	1	8	3	------	------	------	353	655	388	1	1	2
Iowa	1	3	3	5	1	1	177	155	155	1	1	2
Missouri	1	5	3	5	3	3	162	28	188	1	2	5
North Dakota	0	0	1	------	3	1	51	91	68	0	1	0
South Dakota	2	0	1	1	------	------	68	81	35	0	0	0
Nebraska	1	0	3	3	8	5	198	14	195	0	1	1
Kansas	2	6	6	1	11	1	74	10	344	0	2	2
SOUTH ATLANTIC												
Delaware	0	1	1	------	------	------	38	------	23	0	0	0
Maryland [3]	8	5	13	1	5	1	713	63	216	1	0	6
District of Col.	1	0	0	------	------	------	123	11	119	1	1	1
Virginia	2	3	4	176	333	103	491	269	376	1	2	4
West Virginia	1	0	1	9	8	------	80	16	97	3	2	2
North Carolina	8	10	10	------	------	------	17	162	402	0	7	6
South Carolina	1	8	5	113	310	175	173	151	151	0	1	2
Georgia	1	4	3	2	8	8	89	87	87	0	2	3
Florida	13	0	3	1	22	3	412	65	65	1	0	5
EAST SOUTH CENTRAL												
Kentucky	2	1	1	------	1	1	183	69	71	4	0	3
Tennessee	1	4	3	8	33	17	142	49	111	6	3	6
Alabama	7	5	3	1	88	23	55	208	154	5	1	7
Mississippi [3]	6	2	3	2	23	------	24	19	------	0	1	1
WEST SOUTH CENTRAL												
Arkansas	1	7	3	41	53	17	118	61	64	3	0	1
Louisiana	9	3	4	3	5	5	8	34	48	1	6	5
Oklahoma	1	2	2	14	79	22	78	3	71	0	0	1
Texas	11	17	23	312	416	416	2,388	394	443	5	5	6
MOUNTAIN												
Montana	0	0	0	1	5	5	63	43	118	0	0	0
Idaho	1	0	0	73	5	1	76	2	9	0	0	0
Wyoming	0	0	0	------	------	------	70	8	51	0	0	0
Colorado	3	5	6	9	14	14	557	72	315	1	0	1
New Mexico	1	2	2	3	1	2	27	72	65	1	0	0
Arizona	0	8	3	28	52	52	394	134	116	0	0	0
Utah [3]	1	1	0	------	------	1	581	5	98	0	0	0
Nevada	0	0	0	------	------	------	4	------	4	0	0	0
PACIFIC												
Washington	1	2	2	------	12	2	723	13	342	0	1	3
Oregon	0	1	1	12	10	11	238	11	115	1	0	2
California	7	14	16	14	12	13	3,665	214	1,451	5	6	19
Total	162	205	205	854	1,559	1,100	29,319	8,783	22,881	77	86	175
20 weeks	3,765	5,217	5,217	132,320	294,233	184,505	393,154	125,498	396,365	1,602	1,760	4,522
Seasonal low week [4]	(27th) July 5-11			(30th) July 26-Aug. 1			(35th) Aug. 30-Sept. 5			(37th) Sept. 13-19		
Total since low	10,123	12,783	13,947	175,878	327,208	327,208	428,100	148,385	434,378	2,384	2,732	6,974

[1] New York City only.

[2] Philadelphia only.

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended May 22, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	May 22, 1948	May 17, 1947		May 22, 1948	May 17, 1947		May 22, 1948	May 17, 1947		May 22, 1948[6]	May 17, 1947	
NEW ENGLAND												
Maine	0	0	0	14	15	32	0	0	0	0	0	0
New Hampshire	0	0	0	0	0	6	0	0	0	0	0	0
Vermont	0	0	0	3	2	8	0	0	0	0	0	0
Massachusetts	0	0	0	238	121	357	0	0	0	2	4	2
Rhode Island	0	0	0	12	6	11	0	0	0	0	0	0
Connecticut	0	1	0	15	34	69	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	1	4	4	[5] 165	331	567	0	0	0	0	3	3
New Jersey	4	0	0	61	100	146	0	0	0	1	0	1
Pennsylvania	1	0	0	254	193	336	0	0	0	1	3	3
EAST NORTH CENTRAL												
Ohio	1	0	1	222	206	357	0	1	1	1	3	4
Indiana	0	1	0	28	55	59	0	3	2	1	0	1
Illinois	2	2	1	97	78	182	0	0	1	4	1	1
Michigan[3]	1	1	0	175	90	230	0	0	0	0	0	2
Wisconsin	1	0	0	54	68	203	0	1	0	2	0	0
WEST NORTH CENTRAL												
Minnesota	3	0	0	56	69	69	0	0	0	1	0	0
Iowa	5	1	0	28	25	44	0	1	0	0	0	0
Missouri	0	1	0	[5] 28	37	53	0	0	0	0	0	1
North Dakota	1	0	0	2	11	11	0	0	0	0	0	0
South Dakota	9	0	0	3	1	14	0	1	0	1	0	0
Nebraska	2	2	0	10	8	24	0	0	0	0	0	0
Kansas	0	0	0	8	30	51	0	0	0	1	1	0
SOUTH ATLANTIC												
Delaware	0	0	0	2	6	6	0	0	0	0	0	0
Maryland[3]	0	0	0	[5] 31	26	155	0	0	0	2	1	1
District of Columbia	0	0	0	7	6	14	0	0	0	0	0	0
Virginia	0	1	1	26	19	46	0	0	0	4	1	1
West Virginia	0	0	0	11	18	23	0	0	0	0	0	1
North Carolina	13	0	0	18	17	27	0	0	0	1	1	1
South Carolina	0	0	1	4	3	6	0	0	0	2	0	2
Georgia	3	0	0	15	8	11	0	0	0	4	3	3
Florida	5	2	0	19	3	6	0	0	0	3	0	1
EAST SOUTH CENTRAL												
Kentucky	0	1	1	20	17	17	0	0	0	1	0	3
Tennessee	2	0	0	15	31	31	0	0	0	5	2	3
Alabama	1	1	0	9	1	9	1	0	0	2	0	1
Mississippi[3]	1	0	1	0	3	6	0	0	0	2	4	1
WEST SOUTH CENTRAL												
Arkansas	1	1	0	0	4	4	0	0	0	1	4	4
Louisiana	3	0	2	4	2	7	0	0	0	4	2	4
Oklahoma	0	1	0	7	4	10	0	1	1	[7] 1	0	0
Texas	30	2	4	55	21	46	0	0	0	10	8	8
MOUNTAIN												
Montana	0	0	0	7	8	20	0	0	0	0	1	0
Idaho	2	1	0	[5] 27	6	13	0	1	0	0	0	0
Wyoming	0	0	0	2	1	11	0	0	0	0	0	0
Colorado	0	0	0	22	39	56	0	0	0	0	0	0
New Mexico	0	0	0	8	8	14	0	0	0	1	0	0
Arizona	1	0	0	2	2	16	0	0	0	0	0	1
Utah[3]	0	0	0	13	21	21	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	1	0	1	32	26	30	0	0	0	1	1	1
Oregon	0	0	0	16	17	22	0	0	0	0	1	1
California	24	15	11	80	100	148	0	0	0	2	3	4
Total	127	38	38	1,925	1,897	3,686	1	9	10	61	47	73
20 weeks	938	880	696	44,920	50,861	79,410	45	127	206	[7] 993	936	1,168
Seasonal low week[4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	590	268	268	67,459	77,547	117,731	66	181	287	[7] 520	451	560

---

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including cases reported as streptococcal infections and septic sore throat.

[6] Including paratyphoid fever and salmonella infections reported separately, as follows: New Jersey 1, Indiana 1, Virginia 1, Georgia 3, Florida 2.

[7] Delayed report (included in cumulative totals only): Oklahoma, typhoid fever, 4 cases.

Telegraphic morbidity reports from State health officers for the week ended May 22, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended May 22, 1948							
	Week ended—		Median 1943–47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	May 22, 1948	May 17, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	6	26	26	------	------	------	------	------	------	------	1
New Hampshire	30	2	2	------	------	------	------	------	------	------	------
Vermont	32	13	13	------	------	------	------	------	------	------	------
Massachusetts	22	120	132	------	2	------	2	------	------	------	------
Rhode Island	3	46	21	------	------	------	------	------	------	------	------
Connecticut	17	49	49	1	------	------	------	------	------	------	3
MIDDLE ATLANTIC											
New York	115	184	184	10	4	------	------	------	------	------	4
New Jersey	49	242	171	1	------	------	------	------	------	------	------
Pennsylvania	55	194	186	------	------	------	------	1	------	------	1
EAST NORTH CENTRAL											
Ohio	37	------	81	5	------	------	------	------	------	------	5
Indiana	26	39	25	------	------	------	1	1	------	------	1
Illinois	39	82	82	12	5	------	------	------	------	------	2
Michigan [3]	39	182	158	4	8	------	------	------	------	------	5
Wisconsin	42	93	90	------	------	------	1	------	------	------	8
WEST NORTH CENTRAL											
Minnesota	17	49	13	2	------	------	------	------	------	------	4
Iowa	8	27	27	------	------	------	------	------	------	------	1
Missouri	22	31	21	------	------	------	------	------	------	------	2
North Dakota	6	------	------	------	------	------	------	------	------	------	------
South Dakota	4	------	------	------	------	------	------	------	------	------	1
Nebraska	4	0	7	------	------	------	------	------	------	------	1
Kansas	39	48	46	1	------	------	------	------	------	------	1
SOUTH ATLANTIC											
Delaware	1	4	3	------	------	------	------	------	------	------	------
Maryland [3]	12	100	59	------	------	------	------	4	------	------	------
District of Columbia	3	5	8	------	------	------	------	------	------	------	------
Virginia	70	73	63	------	------	43	------	2	1	------	3
West Virginia	6	19	19	------	------	------	------	2	------	------	------
North Carolina	42	151	151	------	------	------	1	1	------	------	------
South Carolina	38	166	105	------	3	------	------	------	------	------	------
Georgia	9	54	9	------	3	------	------	1	------	3	4
Florida	39	92	22	------	1	------	------	------	------	3	2
EAST SOUTH CENTRAL											
Kentucky	56	18	18	------	------	------	------	------	------	1	1
Tennessee	28	45	30	8	------	------	------	2	1	------	------
Alabama	70	108	32	------	------	------	1	------	2	4	------
Mississippi [3]	2	18	------	1	------	------	------	------	------	1	2
WEST SOUTH CENTRAL											
Arkansas	19	68	22	13	------	113	------	------	10	------	------
Louisiana	1	13	10	3	1	------	------	------	------	1	------
Oklahoma	30	16	16	1	------	------	------	1	1	------	------
Texas	386	824	288	12	465	106	------	------	3	4	8
MOUNTAIN											
Montana	6	7	7	------	------	------	------	------	1	------	------
Idaho	3	5	4	------	------	------	------	------	------	------	------
Wyoming	1	------	1	------	------	------	------	2	------	------	------
Colorado	40	36	34	------	------	------	------	6	1	------	3
New Mexico	27	48	16	------	------	------	------	------	------	------	------
Arizona	29	41	18	------	------	53	------	------	------	------	1
Utah [3]	22	16	53	------	------	------	------	------	1	------	3
Nevada	------	------	------	------	------	------	------	------	------	------	------
PACIFIC											
Washington	19	25	25	------	------	2	------	------	------	------	------
Oregon	34	27	24	4	------	------	------	------	------	------	------
California	70	386	373	5	8	------	------	------	------	------	1
Total	1,675	3,801	2,550	83	500	317	6	23	21	17	68
Same week, 1945	3,801	------	------	61	325	142	8	18	31	33	109
Median, 1943–47	2,550	------	------	37	382	118	8	10	17	52	[8] 118
20 weeks: 1948	42,016	------	------	1,431	6,050	3,708	177	52	361	284	1,792
1947	55,715	------	------	952	5,861	3,955	135	46	621	749	2,102
Median, 1943–47	49,852	------	------	597	5,861	2,107	166	46	344	909	[8] 1,760

Period ended earlier than Saturday. [8] 3-year median 1945–47.

Anthrax: New Jersey 2. *Leprosy:* Texas 1.

Territory of Hawaii: Rabies 0, bacillary dysentery 1, leprosy 2, measles 3, scarlet fever 12, whooping cough 6.

WEEKLY REPORTS FROM CITIES *

City reports for week ended May 15, 1948

This table lists the reports from 90 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	2	0	2	0	1	0	0	------
New Hampshire:												
Concord	0	0	------	0	1	0	0	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	3	0	------	0	327	1	10	0	96	0	1	7
Fall River	0	0	------	0	20	0	0	0	2	0	0	3
Springfield	0	0	------	0	26	0	1	0	0	0	0	------
Worcester	0	0	------	0	39	0	10	0	8	0	0	7
Rhode Island:												
Providence	0	0	------	0	18	0	2	0	6	0	0	3
Connecticut:												
Bridgeport	0	0	------	0	2	0	0	0	1	0	0	------
Hartford	0	0	------	0	1	0	1	0	1	0	0	1
New Haven	0	0	------	0	10	0	2	0	4	0	0	9
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	58	1	4	0	12	0	0	8
New York	9	1	4	1	1,449	3	80	1	71	0	2	14
Rochester	0	0	------	0	2	2	4	0	4	0	0	------
Syracuse	0	0	------	0	3	0	2	0	6	0	0	2
New Jersey:												
Camden	0	0	------	0	22	0	1	0	0	0	0	------
Newark	1	0	2	0	428	0	6	0	8	0	0	8
Trenton	0	0	------	0	3	0	1	0	6	0	0	------
Pennsylvania:												
Philadelphia	2	0	2	2	1,053	2	20	0	36	0	0	13
Pittsburgh	0	0	------	0	10	1	8	0	58	0	0	3
Reading	0	0	------	0	5	0	0	0	13	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	127	1	10	0	6	0	0	5
Cleveland	1	0	2	0	50	0	5	0	59	0	1	12
Columbus	0	0	------	0	69	0	1	0	6	0	0	------
Indiana:												
Fort Wayne	0	0	------	0	10	0	2	0	6	0	0	------
Indianapolis	0	0	------	0	217	0	0	0	6	0	1	1
South Bend	0	0	------	0	3	0	0	0	4	0	0	------
Terre Haute	0	0	------	0	------	0	0	0	0	0	0	------
Illinois:												
Chicago	0	0	------	1	431	2	13	0	29	0	0	16
Springfield	0	0	------	0	2	0	2	0	0	0	0	------
Michigan:												
Detroit	0	5	------	0	861	1	7	0	66	0	0	7
Flint	0	0	------	0	3	0	1	0	5	0	0	------
Grand Rapids	0	0	------	0	12	0	1	0	5	0	0	5
Wisconsin:												
Kenosha	0	0	------	0	67	1	0	0	0	0	0	------
Milwaukee	0	0	------	0	185	1	1	0	19	0	0	8
Racine	0	0	------	0	28	0	0	0	2	0	0	1
Superior	0	0	------	0	130	0	0	0	0	0	0	------
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	278	0	1	0	3	0	0	------
Minneapolis	0	0	------	0	22	0	1	0	15	0	0	------
St. Paul	0	0	------	0	64	1	2	0	5	0	0	1
Missouri:												
Kansas City	0	0	6	1	23	0	4	0	5	0	0	10
St. Joseph	0	0	------	0	15	0	0	0	0	0	0	------
St. Louis	2	0	------	0	65	0	11	1	0	0	0	6

*In some instances the figures include nonresident cases.

City reports for week ended May 15, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	2	0	0	0	0	2	0	------
Nebraska:												
Omaha	2	0	------	0	66	0	3	0	1	0	0	------
Kansas:												
Topeka	0	0	------	0	9	0	2	0	1	0	0	4
Wichita	0	0	------	0	4	0	4	0	2	0	0	9
SOUTH ATLANTIC												
Deleware												
Wilmington	0	0	------	0	14	0	2	0	2	0	0	1
Maryland:												
Baltimore	4	0	1	1	500	3	4	0	9	0	1	2
Cumberland	1	0	------	0	------	0	0	0	2	0	0	------
Frederick	0	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	1	0	------	0	116	0	6	0	3	0	0	1
Virginia:												
Lynchburg	0	0	------	0	2	0	1	0	0	0	0	------
Richmond	0	0	------	0	3	0	1	0	1	0	0	------
Roanoke	0	0	------	0	1	0	0	0	0	0	0	------
West Virginia:												
Charleston	0	0	------	0	10	0	3	0	0	0	0	------
Wheeling	0	0	------	0	14	0	0	0	0	0	0	------
North Carolina:												
Raleigh	0	0	------	0	1	0	1	0	2	0	0	------
Wilmington	0	0	------	0	------	0	0	0	1	0	0	------
Winston Salem	0	0	------	0	------	0	0	2	1	0	0	------
South Carolina:												
Charleston	1	0	5	0	1	0	2	0	0	0	0	1
Georgia:												
Atlanta	0	0	------	0	1	0	0	0	8	0	2	1
Brunswick	0	0	------	0	------	0	0	0	1	0	0	------
Savannah	0	0	------	0	3	0	0	0	1	0	0	------
Florida:												
Tampa	0	0	2	0	8	0	3	0	0	0	0	9
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	19	0	10	0	0	0	0	11
Nashville	0	0	------	0	2	1	2	0	2	0	0	------
Alabama:												
Birmingham	0	0	------	1	6	0	1	0	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	3	0	9	0	1	0	0	0	0	------
Louisiana:												
New Orleans	3	0	------	0	4	1	3	6	3	0	0	1
Shreveport	1	0	------	0	------	0	3	0	0	0	0	------
Oklahoma:												
Oklahoma City	0	0	------	0	5	0	1	0	0	0	0	2
Texas:												
Dallas	3	0	1	0	208	2	0	0	10	0	0	1
Galveston	0	0	------	0	------	0	0	0	0	0	0	------
Houston	1	0	------	0	------	0	4	13	2	0	0	------
San Antonio	0	0	1	1	20	0	1	2	0	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	------	0	2	0	0	0	0	1
Great Falls	0	0	------	0	1	0	0	0	0	0	0	------
Helena	0	0	------	0	1	0	0	0	1	0	0	------
Missoula	0	0	------	0	------	0	0	0	0	0	0	------
Idaho:												
Boise	0	0	------	0	------	0	0	0	0	0	0	------
Colorado:												
Denver	0	0	1	0	129	0	3	0	2	0	0	10
Pueblo	0	0	------	0	18	0	0	0	2	0	0	------
Utah:												
Salt Lake City	0	0	------	0	127	0	1	0	3	0	0	2

City reports for week ended May 15, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	1	0	------	0	220	0	0	0	5	0	0	8
Spokane	0	0	------	0	9	0	1	0	2	0	0	------
Tacoma	0	0	------	0	36	0	0	1	3	0	0	------
California:												
Los Angeles	3	0	------	0	368	1	4	3	10	0	1	6
Sacramento	0	0	------	0	24	0	1	0	1	0	0	11
San Francisco	0	0	5	0	264	0	7	2	15	0	0	11
Total	39	6	35	8	8,366	25	293	31	670	2	7	244
Corresponding week, 1947 [1]	73	------	47	11	2,544	------	283	------	613	0	14	882
Average 1943-47 [1]	65	------	51	[2] 13	[3] 5,327	------	[2] 305	------	1,346	1	13	700

[1] Exclusive of Oklahoma City.

[2] 3-year average, 1945-47.

[3] 5-year median, 1943-47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 90 cities in the preceding table (latest available estimated population, 1943, 34,503,900)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	7.8	0.0	0.0	0.0	1,166	2.6	73.2	0.0	311	0.0	2.6	78
Middle Atlantic	5.6	0.5	3.7	1.4	1,404	4.2	58.3	0.5	99	0.0	0.0	23
East North Central	0.6	3.0	1.2	0.6	1,335	3.6	26.1	0.0	130	0.0	1.2	33
West North Central	8.0	0.0	11.9	2.0	1,090	2.0	55.7	2.0	64	4.0	0.0	60
South Atlantic	11.4	0.0	13.1	1.6	1,102	4.9	37.6	3.3	51	0.0	4.9	25
East South Central	0.0	0.0	0.0	6.9	186	6.9	89.6	0.0	14	0.0	0.0	83
West South Central	20.3	0.0	12.7	2.5	625	7.6	33.0	53.3	38	0.0	0.0	10
Mountain	0.0	0.0	7.9	0.0	2,192	0.0	47.7	0.0	64	0.0	0.0	103
Pacific	6.3	0.0	7.9	0.0	1,457	1.6	20.6	9.5	57	0.0	1.6	57
	5.9	0.9	5.3	1.2	1,268	3.8	44.4	4.7	102	0.3	1.1	37

Dysentery, amebic.—Cases: New York 9; Detroit 1; New Orleans 3; Los Angeles 3.

Dysentery, bacillary.—Cases: New York 1; Charleston, S. C., 2.

Dysentery, unspecified.—Cases: San Antonio 15.

Typhus fever, endemic.—Cases: Tampa 2; Birmingham 1.

PLAGUE INFECTION IN GUADALUPE COUNTY, NEW MEXICO

Under date of May 17, plague infection was reported proved in a pool of 72 fleas from 9 rock ground squirrels, *Citellus variegatus*, taken on April 28 at a location 4 miles west and 2 miles north of Santa Rosa, Guadalupe County, New Mexico, and in a pool of 34 fleas from 8 ground squirrels, same species, taken April 29, 5 miles northwest of Santa Rosa, on the east side of the Pecos River.

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended May 1, 1948.—During the 4 weeks ended May 1, 1948, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chickenpox	89	Syphilis	113
Diphtheria	39	Tetanus	13
Dysentery	7	Tetanus, infantile	3
Gonorrhea	188	Tuberculosis (all forms)	911
Influenza	27	Typhoid fever	9
Malaria	133	Typhus fever (murine)	3
Measles	1,077	Whooping cough	121

DEATHS DURING WEEK ENDED MAY 15, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended May 15, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	9,388	9,331
Median for 3 prior years	9,202	
Total deaths, first 20 weeks of year	198,229	198,445
Deaths under 1 year of age	743	777
Median for 3 prior years	613	
Deaths under 1 year of age, first 20 weeks of year	13,815	15,841
Data from industrial insurance companies:		
Policies in force	71,062,649	67,292,728
Number of death claims	12,976	11,647
Death claims per 1,000 policies in force, annual rate	9.5	9.0
Death claims per 1,000 policies, first 20 weeks of year, annual rate	10.1	10.0

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended May 1, 1948.—During the week ended May 1, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		36	3	134	443	49	13	20	105	803
Diphtheria				11	5					16
Dysentery, bacillary				3						3
Encephalitis, infectious				3						3
German measles				30	18		2	3	11	64
Influenza		45			10	5			13	73
Measles		3		614	1,223	7	4	42	161	2,054
Meningitis, meningococcus			1		1	1			1	4
Mumps		6		274	320	38	79	50	19	792
Poliomyelitis				3	1		1			5
Scarlet fever		7	5	55	65	41	2	6	4	185
Tuberculosis (all forms)		7	10	82	25	39	9	10	29	211
Typhoid and paratyphoid fever				3						3
Undulant fever				1	1			1	3	6
Venereal diseases:										
Gonorrhea	2	12		113	78	26	16	41	98	386
Syphilis	1	10	2	43	51	10	3	12	20	152
Other forms									2	2
Whooping cough		4		53	22	8	7	31	1	126

CUBA

Habana—Communicable diseases—4 weeks ended May 1, 1948.—During the 4 weeks ended May 1, 1948, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chickenpox	5		Measles	13	
Diphtheria	11		Tuberculosis	14	
Leprosy	2		Typhoid fever	8	
Malaria	4				

Provinces—Notifiable diseases—4 weeks ended May 1, 1948.—During the 4 weeks ended May 1, 1948, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana[1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	3	13	13	16	1	22	68
Chickenpox		5				1	6
Diphtheria		14			2		16
Hookworm disease		19					19
Leprosy		8				1	9
Malaria	7	4	1		1	5	18
Measles		14	6	2			22
Tuberculosis	8	17	16	15	14	18	88
Typhoid fever	6	20	6	24	6	28	90
Whooping cough		63					63

[1] Including Habana city.

NEW ZEALAND *

Notifiable diseases—5 weeks ended May 1, 1948.—During the 5 weeks ended May 1, 1948, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	6		Ophthalmia neonatorum	1	
Diphtheria	28	1	Poliomyelitis	127	4
Dysentery:			Puerperal fever	8	
Amebic	9		Scarlet fever	109	
Bacillary	29		Tetanus	2	1
Erysipelas	15	1	Trachoma	2	
Food poisoning	5		Tuberculosis (all forms)	178	59
Lead poisoning	2		Typhoid fever	4	
Lethargic encephalitis	2	1	Undulant fever	6	
Malaria	3				

STRAITS SETTLEMENTS

Singapore—Poliomyelitis.—An outbreak of poliomyelitis has been reported in Singapore with a total of 47 cases and 8 deaths during the period April 17–May 11—27 cases with 6 deaths in children, 20 cases with 2 deaths in adults.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

India—Calcutta.—During the period April 25–May 15, 1948, 1,269 cases of cholera were reported in Calcutta, India.

Indochina (French)—Cochinchina—Saigon.—For the period April 25–May 15, 1948, 36 cases of cholera were reported in Saigon, Cochinchina, French Indochina.

Pakistan—Lahore.—For the period April 27–May 17, 1948, 73 cases of cholera were reported in Lahore, Pakistan.

Plague

Ecuador—Loja Province.—For the week ended April 24, 1948, 3 cases of plague were reported in Loja Province, Ecuador.

India—Calcutta.—During the period April 25–May 8, 1948, 126 cases of plague were reported in Calcutta, India, and for the week ended May 15, 21 cases were reported.

---

*Figures published in the table on page 671 of the PUBLIC HEALTH REPORTS for May 14, 1948, were for the 4 weeks ended March 27 instead of April 3.

Pakistan—Lahore.—For the week ended May 1, 1948, 11 cases of plague were reported in Lahore, Pakistan.

Venezuela—Aragua State—Tejerias.—For the week ended May 1, 1948, 7 cases of plague with 3 deaths were reported in Tejerias, Aragua State, Venezuela, instead of 3 cases with 3 deaths as reported earlier. (Pub. Health Rep., May 21, 1948, p. 703).

Smallpox

Ecuador.—During the period March 1–31, 1948, 375 cases of smallpox with 28 deaths were reported in Ecuador, including 38 cases in Guayaquil and 42 cases in Quito. For the period April 1–30, 1948, 264 cases with 34 deaths were reported, including 21 cases in Guayaquil and 16 cases in Quito.

India—Calcutta.—During the period April 25–May 15, 1948, 190 cases of smallpox were reported in Calcutta, India.

Trinidad.—Information dated May 26, 1948, states that the presence of 8 cases of alastrim has been reported in the Colony of Trinidad, and that all necessary precautionary measures are being taken.

Typhus Fever

Bolivia—La Paz Department—La Paz.—For the period April 1–30, 1948, 36 cases of typhus fever were reported in La Paz, La Paz Department, Bolivia.

Ecuador.—For the period April 1–30, 1948, 50 cases of typhus fever were reported in Ecuador.

×

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued in reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948

For sale by the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 JUNE 18, 1948 NUMBER 25

IN THIS ISSUE

Oral Cancer and the Dentist

Arkansas Cancer Detection Project

Revised Morbidity Reporting Requirements

Communicable Disease Summary

1798

FEDERAL SECURITY AGENCY

PUBLIC HEALTH SERVICE

FEDERAL SECURITY AGENCY
Oscar R. Ewing, Administrator

PUBLIC HEALTH SERVICE
Leonard A. Scheele, Surgeon General

Division of Public Health Methods
G. St. J. Perrott, Chief of Division

CONTENTS

Page
Role of the dentist in oral cancer detection. Ralph S. Lloyd 805
Objectives and program of the Arkansas cancer detection project. Allen N. Koplin 813
Revised morbidity reporting requirements 822
Four-week summary of communicable disease incidence 823

INCIDENCE OF DISEASE

United States:

- Reports from States for week ended May 29, 1948, and comparison with former years 827
- Weekly reports from cities:
  - City reports for week ended May 22, 1948 831
  - Rates, by geographic divisions, for a group of selected cities 833

Plague infection in New Mexico and Texas 833

Foreign reports:

- Canada—Provinces—Communicable diseases—Week ended May 8, 1948 834
- Japan—Notifiable diseases—4 weeks ended May 1, 1948, and accumulated totals for the year to date 835
- Mexico—Reynosa—Poliomyelitis 835
- Reports of cholera, plague, smallpox, typhus fever, and yellow fever received during the current week—
  - Cholera 835
  - Plague 835
  - Smallpox 836
  - Typhus fever 836

Deaths during week ended May 22, 1948 836

Public Health Reports

Vol. 63 • JUNE 18, 1948 • *No. 25*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

Role of the Dentist in Oral Cancer Detection

By RALPH S. LLOYD, *Senior Dental Surgeon, Baltimore Marine Hospital, Public Health Service*

The dentist has an important role in the control of cancer. He has an opportunity to detect early malignant processes in the oral cavity and on the face because many people in this country have been educated to the fact that they should see their dentists at regular intervals. The dentist should assume a definite responsibility in the detection of cancer in the oral cavity and about the head and neck. The patients the dentist observes usually have no medical complaints. Early malignant lesions are relatively asymptomatic, and the person who has an early lesion probably is not aware of its importance. The alert dentist may aid the patient by recognizing the early malignant lesion. The physician, on the other hand, usually has the opportunity to see people only when they have a definite complaint and when they report to him for specific treatment. It appears that the dentist has a better opportunity to scan the apparently well population than does the physician.

Prevalence

Statistics of the Memorial Hospital for treatment of cancer and allied diseases in New York City show that 60 percent of the patients with cancer of the gums had consulted a dentist first (*1*). The dentists who were consulted did not recognize these malignant lesions in a large percentage of cases. In a total of 157 cases of carcinoma of the oral cavity, 38 percent were recognized by dentists as probably being carcinoma. On the average it took 3½ weeks for the patient to be referred by a dentist to a physician. The remaining 62 percent of these cancer cases were probably not recognized by the dentist, and it took an average of 8 months for these cases to obtain diagnostic service. The physician also may fail to detect the presence of neoplastic processes. A group reported that 5 to 10 percent of oral cancer patients referred to their clinic could be considered early cases despite the fact that in a large majority of instances the patient probably sought medical advice at some earlier stage in the disease (*2*).

Neoplasms in other parts of the body are often difficult to detect in the early stages because they are not easy to see. On the other hand the lips and oral cavity lend themselves well to visual examination. The oral cavity is easily inspected, although small lesions on the base of the tongue or deep in a fissure may be difficult to see.

The dentist or physician should realize that the man who has the first opportunity to suspect a malignant growth has the golden opportunity to save the patient's life (*1*). It is his responsibility to see that the patient is placed in competent hands for treatment. If cancers of the head and neck are treated when the lesions are less than 2 cm, 55 percent can be cured. If both early and late cases are included, the percentage of survival is only 32 percent. In late cases the percentage of cure is much smaller.

The death rate from cancer in the United States is on the increase. In 1940 there were 158,335 deaths attributed to cancer, while in 1945 cancer accounted for 177,464 deaths. Preliminary information for 1946 yields a figure of 181,346 deaths from cancer. On the basis of incidence rates it is estimated that there are about 475,000 to 500,000 persons under treatment for cancer at any given time in the United States. About 300,000 new cancer cases are diagnosed for the first time during each year. In addition to these cases are those which have been treated and cured, as well as those which have not been diagnosed. The number in the latter two categories is unknown.

An estimated 10 percent of all cancers in men and 2 percent of all cancers in women occur in the buccal cavity, which includes the lips. The prevalence rates of cancer indicate that 20,000 persons probably developed cancer of the buccal cavity in 1947 (*3*).

Definition

Malignant neoplasms may be grouped under the term cancer. It is preferable for purposes of this discussion to include all carcinomas and sarcomas under the term cancer.

A neoplasm or cancer is an autonomous new growth of tissue. It arises spontaneously, and it serves no useful purpose. As long as the blood supply and metabolic capacity of its host permit, neoplastic growth continues. It spreads by expansion, infiltration, or by metastasis to other parts of the body. Positive cure is achieved only by complete removal or destruction of the new growth and metastases if present (*4*).

Any ulceration that does not respond to treatment in 2 weeks should be considered a cancer until it is proved otherwise. The same may be said of any growth or swelling that is progressive or shows no tendency to regress after 1 month's duration. There may be many pathological conditions, but the main ones in which a delay in diagnosis is fatal are those which are neoplastic.

Martin states that it can be said without hesitancy that oral cancer is more serious and more important to the patient than any other condition with which it might be confused (*1*). He also states that a dentist or a physician should consider the possibility of cancer first in any suspicious lesion instead of waiting to see what happens. There are chronic conditions such as syphilis and tuberculosis with which cancer may be confused. The treatment of such chronic conditions does not constitute an emergency, but the early diagnosis and treatment of cancer are emergency measures. An innocuous-looking chronic ulcer, if cancerous, may metastasize at any moment, and then it has reached a stage where the chances of cure are markedly reduced. This may occur while the observer is waiting to see what happens.

Etiology

The exact etiology of cancer is obscure; however, chronic irritation can often be demonstrated to have preceded cancer. There are two groups of factors concerned with cellular growth of neoplasms. The intrinsic factors of cellular growth are those within the cell. Properly controlled, they are concerned with normal growth and repair of tissues. Abnormal forces, however, probably contribute to the etiology of neoplastic growth. Heredity may be one of these intrinsic factors. Clinical observation and studies of familial tendencies have shown that certain families of humans and certain strains of animals tend to have a higher incidence of carcinoma, and that they tend to develop a neoplastic lesion at an earlier age than the average for the general population. We, as dentists, cannot alter these intrinsic factors. However, the other group of etiological factors are more controllable. They are the extrinsic or environmental factors of chronic irritation. Chronic irritation results from mechanical, thermal, or chemical trauma, or from actinic rays and rays from radioactive substances.

Mechanical irritation probably influences the development of a lesion on the lip, buccal mucosa, or tongue in the presence of sharp, jagged, protruding teeth or ill-fitting dentures (*5*). Most authorities refer to ill-fitting dentures as one of the causative factors of neoplasms of the buccal cavity, although some men do not agree with this theory. The relation of thermal irritation to neoplastic growth is demonstrated by the frequency with which neoplastic processes develop in burn scars.

Chemical irritation can be shown to initiate neoplastic growth. Coal-tar products are definitely carcinogenic. Laboratory experiments have proved this in animals. Chimneysweeps have a high incidence of carcinoma of the scrotum, and persons who work with tar have a high incidence of carcinoma of the exposed skin (*5*).

Mechanical, thermal, and chemical irritation may result from the use of tobacco. Chronic mechanical irritation results from the constant holding of pipes or cigars in the mouth. Thermal irritation results from the heat of burning tobacco and the hot air being drawn into the mucous membrane. Chemical irritation may result from the coal tar by-products of combustion.

Actinic rays of the sun irritate the exposed parts of the body. The lower lip frequently develops crusting and chronic fissures from exposure to the sun and extremes of weather. Fishermen and sailors have a high incidence of basal cell carcinoma on the skin of the face and squamous cell carcinoma of the lip. The lips can be protected from the actinic rays by applying an ointment.

Roentgen rays and rays from radioactive substances are definitely carcinogenic. Early workers with roentgen rays frequently developed carcinoma of the skin of the hands. The victims of the atom bomb are being observed for evidence of cancer development.

Syphilis may be an influencing factor especially in cancer of the tongue. It is stated that in otherwise healthy men in the 55- to 60-year age group, the general incidence of syphilis is 4 to 6 percent. On the other hand, more than 30 percent of the men in this age group who have cancer of the tongue will be found to have syphilis (*1*). Syphilis causes chronic glossitis which probably is a precancerous lesion.

Avitaminosis, particularly of the B complex type, may cause lesions which develop into cancer. Cheilitis and perleche or fissures at the angles of the mouth occur in riboflavin deficiencies. Leukoplakia often may be connected with vitamin deficiencies. Diffuse atrophy of the papillae of the tongue and chronic inflammation are shown in the beet red tongue of pellagra. Many think that these forms of chronic irritation are definitely carcinogenic.

Two cases can be cited in which irritation may have influenced the course of neoplastic growth.

Case No. 1.—White man, age 56, fell asleep with a lighted cigarette in his mouth. The burned area ulcerated, failed to heal, and within 5 weeks a squamous cell carcinoma, grade II, developed in the ulcer.

Case No. 2.—White man, age 56, had been a heavy pipe smoker all of his life. He had various areas of leukoplakia and had a typical pipe smoker's mouth. One month before admission he fell and jammed the pipe stem against his hard palate. A firm, hard lump with superficial ulceration developed. It was diagnosed as squamous cell carcinoma grade II.

Signs and Symptoms

The general dental practitioner cannot be expected to be fully conversant with the treatment and the clinical course of neoplastic processes. He should, however, be acquainted with certain signs and symptoms which will lead him to suspect the presence of a neoplasm.

The dentist should perform a complete examination of the buccal cavity of every patient. The examination should be systematic and routine. It is suggested that a definite examination procedure be followed. The teeth are of primary importance to the dentist and probably will be examined first. After the teeth, the remaining soft and hard supporting tissues should be carefully examined. The tissues can be reflected with a mouth mirror and easily seen. A suggested procedure is the examination of alveolar ridge, floor of mouth, tongue, hard and soft palate, and tonsillar region. The lips also should be examined. Cancers of the lip are important because they are the most frequent of all buccal cancers, and they are the most easily cured. Finger cots should be available for use in the examination. If any suspicious lesions are found, a palpation with a finger will help to determine the invasive tendency of the lesion by feeling the amount of swelling or induration present.

Examination of other external tissues of the head and neck are outside the realm of the dentist. However, a dentist might detect lesions with definite malignant characteristics on the skin of the head and neck. While talking with the patient, he will note the patient's voice. Any hoarseness that has been present for a month or more may be due to cancer of the vocal cords. The dentist will do the patient a great service if he will become acquainted with the general manifestations or symptoms of cancer of the head and neck and especially of the oral cavity.

Early cancer of the oral cavity will manifest itself as a small nodule or ulcer. It may be painless, under 3 mm. in diameter, and the patient may not be aware of its existence. Leukoplakia may begin to thicken, to ulcerate, or to form fissures (*6*). The bases of the new lesions have a hard button-like feel, and they tend to infiltrate into the surrounding tissue. They are indurated. If these changes are discovered at this stage, the chances of cure are very good. If such a nodule grows larger (approximately 1 cm.), and the blood supply is reduced, it may ulcerate. The surface of the ulcer is coarsely granular, and it bleeds readily when irritated. Nelson points out that the bleeding is arterial or bright red while the bleeding from inflammatory processes, which are passively congested, is venous or dark in color (*7*).

As the lesion becomes larger and more ulcerated, secondary infection occurs. The lesion becomes fissured, excavated, and necrotic. A characteristic odor accompanies the necrosis, and the lesion becomes painful. The infiltration or induration increases, the mass has a hard feel, and the extent of the growth can be determined approximately by the extent of the induration (*1*). If metastases have occurred to the regional lymph nodes, the prognosis is poorer. Carcinomatous tissue is friable because it lacks a connective tissue stroma. It breaks off readily when bits are removed for biopsy.

Another type of neoplastic lesion is the proliferative one. Instead of ulcerating early, this lesion grows outward with a papillary or cauliflower-like growth. The surrounding tissues are not infiltrated as much as in the infiltrative or ulcerative types. The blood supply is maintained, and ulceration does not occur early. The tissues also are friable when cut for biopsy.

Cancer of the Face

The two most frequent forms of cutaneous cancer of the face are basal and squamous cell carcinoma. A typical basal cell carcinoma rarely shows rapid growth, and it has a firm, greyish white, translucent, pearly, rolled edge usually without deep induration. The sharply demarcated rolled edge is quite characteristic. The lesion grows slowly and rarely metastasizes, but it is locally destructive. The central portion of the lesion may be ulcerated or crusted. The edges of an ulcerated lesion may undermine the surrounding skin, and it is then called an indolent or rodent ulcer. Early squamous cell carcinoma is usually bulkier in growth than the basal cell carcinoma. It metastasizes more frequently to regional lymph nodes. A third type of cancer of the skin is the malignant melanoma which some believe may develop from a pigmented mole or nevus. Melanomas are very malignant and metastasize early and widely.

Cancer of the Lip

The lip is the most prevalent site of buccal cancer. Cancer of the lip occurs predominantly in the white male. Forty-seven percent of the oral cancers in the white male occur on the lips, and this comprises 5 percent of all cancers in the male. Eighty-four percent of carcinomas of the lip in whites occur in the male. This type of cancer is many times more prevalent in the white male than in the colored male (*3*). The high incidence and the high cure rate that is possible with early discovery of the lesion on the lip make this site the most important for consideration by the dentist. Memorial Hospital reports a 5-year cure rate of 86 percent in primary lesions less than 2 cm. in size, and a cure rate of 70 percent for all cancers of the lip (*1*).

Carcinomas of the lower lip are almost always the squamous cell type, and carcinomas of the upper lip are usually of the basal cell type.

The typical squamous cell carcinoma of the lower lip arises in the vermillion border. It begins either as a small nodule or papule, and when it grows, it tends to infiltrate the tissue below it, and the surface ulcerates early. This lesion may be confused with herpes or chancre. However, chronicity is the diagnostic feature. A carcinomatous lesion does not regress; therefore, any ulceration of the lip that persists after 2 weeks is carcinoma until proved otherwise (*1*). Basal cell carcinomas may develop on the cutaneous surface of the upper lip and may involve the vermillion border secondarily. They usually are typical of basal cell carcinomas elsewhere and have been described previously.

Other Cancers of the Mouth

Carcinoma of the tongue is the next most prevalent site of cancer of the buccal cavity. This type comprises 1.8 percent of all cancer, and 18 percent of all cancer of the buccal cavity in white males (*3*). Cancer of the tongue presents a difficult problem. The prognosis is not good. Memorial Hospital gives a 5-year cure rate for "all comers" of 28 percent and for lesions less than 2 cm. in size, of 55 percent (*1*). Most lesions of the tongue are in an advanced stage when they are discovered because they progress rapidly and are painless in the early stages. Because the patient cannot see it, he does not become aware of the lesion's existence until it is advanced. Metastases occur very early probably because of the mobility, extreme vascularity, and rich lymphatic supply of the tongue (*8*). Squamous carcinoma is the most frequent type of cancer of the tongue. It is often associated with an area of leukoplakia or syphilitic glossitis. Tongue cancers frequently ulcerate, infiltrate rapidly, and immobilize the surrounding tissues. The lateral borders of the tongue are most frequently involved, as might be expected, since these regions are subjected to the greatest trauma.

Cancer of the mouth is computed to be 2.1 percent of all cancer and 22 percent of all cancer of the buccal cavity in white males (*3*). Presumably cancer of the alveolar ridge, floor of the mouth, hard and soft palate, and tonsillar region are included in this estimate. The prognosis in all of these is poor. The 5-year cure rate at Memorial Hospital is 46 percent with lesions less than 2 cm. in size, and 25 percent with "all comers," both early and advanced (*1*). One can see, therefore, that the early diagnosis and treatment of lesions of the lip, tongue, and mouth will increase the chance of cure.

A number of malignant tumors may involve the jaws and palate. They may develop in bone, the soft tissues, or in the dental structures and include such tumors as squamous cell carcinoma, adenocarcinoma, adamantinoma, and various types of sarcomas. Squamous cell carcinoma is the most common.

Biopsy

The problem of biopsy is one which will have to be handled with care by the dentist. Of course every suspicious lesion should have a piece taken from it for submission to a competent pathologist for study. A principal deficiency on the part of physicians in the handling of neoplasms is the failure to have samples of suspicious lesions examined histologically. The dentist is restricted to specific sites, and he should limit his operations to oral tissues. A biopsy should be performed on all bone cysts, alveolar granulomas, and on any ulcer or swelling of the gingiva which has the characteristics of a neoplasm. A dentist should see that a biopsy is obtained from any ulceration of the floor of the mouth, gingival buccal gutter, tonsils and tonsillar pillars, and hard palate which shows the characteristics of a neoplasm. One should bear in mind that a single negative biopsy does not rule out cancer. It is not unusual to have many negative biopsies before a positive biopsy demonstrates the presence of cancer.

A definite technique must be followed for the procedure of taking a specimen for biopsy. A specimen of tissue may be obtained by cutting with a scalpel or biting with biopsy forceps or rongeurs. The specimen should be obtained with as little trauma as possible. It should be placed immediately in a fixing agent. A 10 percent solution of formalin is usually employed as the fixing agent.

The site from which the specimen is obtained is important. The specimen should be removed from the advancing edges of the neoplasm. It should contain some normal surrounding tissue, the vascular bed of the neoplasm, and some of the more centrally located tissue. It must be remembered that the tissue from the center of the growth may be necrotic, composed of scabs, crusts, or keratinized epithelium so that it will not be adequate material for a biopsy.

Certain clinical data must be submitted with the specimen to the pathologist. A brief history, the duration of the lesion, a description of the location, and gross characteristics are necessary to the pathologist for an accurate report.

In summary, the general characteristics of cancer of the oral cavity are chronicity, tumefaction, induration, and ulceration. Any ulcer or swelling which is present for 2 weeks and which shows no signs of regression is cancer until proved otherwise. The dentist has an important role in the control of cancer. He should make it his duty to detect cancers of the oral cavity and to influence the patient to obtain proper treatment.

REFERENCES

(*1*) Martin, Hayes: Mouth cancer and the dentist. J. Am. Dental Assoc. **33**: 845 (1946).

(*2*) Blair, V. P., Moore, S., and Byars, L.: Cancer of the face and mouth. St. Louis, Mosby, 1941, p. 22.

(*3*) Dorn, Harold F.: Illness from cancer in the United States. Pub. Health Rep. **59**: 33 (Jan. 14); 65 (Jan. 21); 97 (Jan. 28) 1944. (Reprint No. 2537.)

(*4*) Ewing, James: Neoplastic Diseases, ed. 3, Philadelphia, Saunders, 1928 (reprinted 1934) Chap. II, p. 63.

(*5*) Kerr, Donald A.: Oral cancer—the dentist's responsibility. J. Michigan Dental Soc. **29**: 117 (1947).

(*6*) Pfahler, George E.: The dental surgeon in relation to the prevention and cure of cancer. J. Am. Dental Assoc. **22**: 1376 (1935).

(*7*) Nelson, Peter A.: Early diagnosis of intra-oral cancer. J. Am. Dental Assoc. **27**: 1645 (1940).

(*8*) Figi, F. A.: Malignant diseases of the mouth. J. Am. Dental Assoc. **26**: 1979 (1939).

Objectives and Program of the Arkansas Cancer Detection Project

By ALLEN N. KOPLIN, S. A. *Surgeon* (R) *Cancer Control Branch, National Cancer Institute*

Philosophy and Objectives

A cancer detection project was inaugurated at the Public Health Service Medical Center in Hot Springs National Park, Arkansas, on November 1, 1947. This activity is a part of the program of the Field Operations Unit, Cancer Control Branch, National Cancer Institute, and follows the recommendation of the National Advisory Cancer Council which states:

> (10) That the National Cancer Institute give aid in providing the physical facilities, scientific equipment, and, if necessary, the training of personnel in a few cancer centers strategically located from a geographical point of view and associated with one or more medical centers. * * * From the experience gained in these several demonstration centers, it should be possible to develop a plan applicable to the whole country to insure that cancer patients receive the best that medical science has to offer in the way of diagnosis and treatment. The availability of treatment in these centers should not be denied to anyone because of inability to pay (*1*).

The field of cancer control, in its broadest sense, encompasses fundamental and applied research, diagnosis, treatment, case-finding and follow-up, statistical studies, and informational activities. The Arkansas project was undertaken to evaluate one of the newer case-finding devices—the cancer detection center.

Specifically, the objectives of the project may be stated, as follows:

1. **To develop practicable and effective methods of organization and administration of a cancer detection center.**
2. **To develop and evaluate methods of history taking and physical examination best suited to detection centers.**
3. **To demonstrate the potentialities of basic laboratory procedures required in a cancer detection center.**
4. **To demonstrate the effectiveness of the cytologic test for cancer, and its applicability as a mass screening procedure to large numbers of persons.**
5. **To develop a system of follow-up so that individuals discovered to have a major abnormality may be insured of further diagnostic care and eventual treatment.**

Several varying philosophies have been followed in the establishment of detection centers. One is the contention that their main usefulness lies in the education of private physicians, who serve part-time in order to become familiar with precancerous lesions and early cancer, and to become more adept in the performance of ideally comprehensive physical examinations. This type of examination must obviously be time-consuming.

Another philosophy holds that a detection center should be utilized primarily to provide cancer screening services to examinees, and that a less time-consuming examination should be performed, limited to those sites at which cancer is most likely to be discovered. This philosophy has been justified on the grounds that it makes possible the screening of very large numbers of persons and yields a much greater number of curable lesions than any other approach.

In the Arkansas project, a rather middle ground philosophy has been adopted. The Hot Springs physicians are developing an effective complete physical examination procedure which, while it has educational value, will also be capable of application in other detection centers established for the purpose of providing screening services for large numbers of apparently well persons.

The experience of others has led to the belief that cancer detection centers, while worthwhile from an ideal standpoint, are an expensive undertaking—certainly outside the realm of practicability for the average community. In a discussion of the practicability of these centers, there is a reference (*2*) to the cost, estimated at $7,000–$8,000, of discovering a cancer case in a detection center. It is concluded therefrom that:

> It is true that human life is priceless, and that discovery of a case of cancer in a curable stage is worth any amount of money and effort. But this philosophy can be applied to only one person. If you apply it to everybody you run into the difficulty that time and money are available in only finite amounts and must be allocated to all the other essential things of living (*3*).

Actually the incidence of cancer among the total population is such that when costs are brought down to the irreducible minimum they will still be higher than those necessary for the discovery, for example, of dental caries or heart disease because both of the latter conditions are considerably more common. If we examine the incidence rate of cancer, which is estimated at 200 per 100,000 population (*4*), it is apparent that only 1 in 500 persons of all ages, or 0.2 percent, will develop cancer within the ensuing year. If the cost of examining the whole 500 must be allocated to the single case discovered, the result is bound to be a staggering figure. Even though detection centers show an incidence rate of 1½ to 2 percent (*5*) (probably because of the presence of various selection factors, such as age), a study of 10 detection centers in New York City for the first 3 months of 1947 revealed a cost of $6,486 per case (*6*).

While the relatively low incidence rates are in part responsible for high costs, another factor which further increases costs is the limited service most centers provide. There are only a handful of full-time centers operating 5 days a week, 8 hours a day. Most of them operate on a part-time basis holding sessions once or twice a week or, in many instances, 1 or 2 hours a month. Obviously, if equipment is purchased to establish the center and it is utilized only a small portion of the time, the cost of operation will be high. A by-product of part-time service is the relatively small numbers of examinees seen, a factor which raises the cost per examination.

Since it is desirable to utilize well trained physicians and laboratory workers, the personnel costs on a part-time or hourly basis are inevitably higher than they would be with the use of a full-time staff. Although complete information is still lacking, it has been reported that the current cost per case discovered has been reduced in some detection centers to approximately \$1,800–\$2,000. This is probably due in large measure to the expansion of service to approach a full-time operation. Although this figure may be further reduced in the future, it is clear that early cancer detection even at this cost is far less expensive than permitting the case to go undiagnosed until the patient becomes a candidate for extremely costly advanced cancer care.

Through the Hot Springs project it is planned to demonstrate if excessive costs can be prevented when certain basic principles are applied. First, the pilot detection center operates on a full-time basis. Second, it has been established in conjunction with an existing hospital facility, thereby making it unnecessary to purchase the full range of equipment needed in most detection centers, such as X-ray apparatus and centrifuges. Third, through the existent hospital facility, we are able to draw upon full-time medical, nursing, laboratory and auxiliary personnel.

Efforts are being made to develop a clinical examination procedure which is both relatively complete and adaptable for use in centers examining large numbers of patients. To achieve this, we are attempting to evaluate the epidemiologic or "statistical" approach to clinical examinations. The recently published study by White and Geschickter (7) emphasizes the importance of concentrating on those sites where pathology most frequently occurs which should go a long way toward solving the problem of the 6 to 12 months backlog of many detection centers. The culpability of physicians and patients in delaying diagnosis and treatment has been the subject of much study and rightly so. But there is an equal need for an analysis of the factors causing the large backlogs in detection centers, which are also responsible for delayed diagnosis and treatment. The patient who has to wait 6 to 12 months before being examined in the detection center is in just as precarious a position as one who procrastinates out of ignorance or one not properly advised. In some areas patients are advised to report to their family physician when the backlog is so large that they cannot be seen before a period of 2 months. In the Hot Springs project it is hoped sufficient administrative experience will be gained in the operation of a detection center to determine how this type of delay can be eliminated.

Another by-product anticipated from the Arkansas project is a comprehensive study of the relationship between the incidence of cancer and that of the venereal diseases, particularly syphilis and lymphogranuloma venereum.

One of the most important aspects of the Hot Springs project is the development of a pre-treatment follow-up mechanism through which is accomplished the desirable sequence of events from early discovery to final treatment. A trained public health nurse with basic orientation in cancer has been assigned to the staff for the primary purpose of assisting in this follow-up work.

It is planned, in addition, to evaluate carefully the cytologic test for cancer as a screening device, and to develop a training program by means of which the kinds of personnel and type of training necessary to establish cytology services will be determined.

Program

As many public health workers know, the Hot Springs Medical Center is a venereal disease rapid-treatment center operated by the Venereal Disease Division of the Public Health Service. The case load approximates 15,000 a year or close to 300 patients weekly. Approximately 90 percent are Negroes, and 98 percent are indigent. The majority have a venereal disease: either syphilis, gonorrhea, lymphogranuloma venereum, or granuloma inguinale. A certain percentage are in the advanced or chronic stages, and are hospitalized in the 88-bed hospital of the Medical Center. The majority of the patients are examined in the hospital's male and female outpatient clinics and domiciled in dormitories. Although the patient load of the Center is not a strict random sample because it consists largely of venereal disease suspects, it is felt that an important element of selectivity—namely the patient's desire for physical examination—is largely eliminated. This factor interferes with the random distribution of patients in many detection centers for, although applicants are presumably well, many seek examination because of some definite symptomatology.

A quota of approximately 50 examinees in the highest age groups for each day is routed through the cancer detection unit. A brief objective screening history (fig. 1) is elicited by trained history clerks and clinic nurses. A physician with special training in the diagnosis of cancer then studies pertinent data on the history sheet in more detail, and elaborates as needed. Experience has shown that an unhurried, sympathetic and generally pleasant approach makes possible the completion of a satisfactory history.

PHS-777-1 (INC)
4-48
PATIENT'S HISTORY
Cancer Control

Clinic No. ....
C. C. U. No. ....

Name (*Last*)	(*First*)	(*Middle*)	Date

Age	Date of Birth (*Month, year*)	Sex ☐ Male ☐ Female	Color	Marital Status S M W D	Weight

I. Family History of Cancer (*Died of cancer? Age at death, TYPE*)

II. Past History
(1) Medical

(2) Surgical

(3) Venereal Disease

Menstrual History	Cycle	L. M. P.
	Metrorrhagia	Menorrhagia
	Menopause (*Date*)	Hormonal Treatment
	Post Menopausal Bleeding	X-ray Treatment
Obstetrical	No. of Pregnancies	No. of Children
	Were Babies Breast Fed?	Average Length of Time

III. Habits (*Smoking*)

IV. Systemic Review

(1) General	Weight Loss		Weakness
(2) Head and Neck	Chronic Hoarseness	Dysphagia	Mouth Sores
(3) Lungs	Chronic Cough	Hemoptysis	Chest Pains
(4) Stomach	Appetite	Abdominal Pain	Indigestion
(5) Rectum	Change in Bowel Habits	Blood in Stool	Melena
(6) Skin	Lumps	Sores	Skin Operations
(7) Genito-Urinary	Hematuria	Frequency	Dysuria
(8) Breasts	Lumps	Nipple Discharge	Tenderness
(9) Gynecologic	Vaginal Discharge	Bleeding	Pelvic Pain

Figure 1

PHS-777-2 (NC 1)
4-48
PHYSICAL EXAMINATION
CANCER CONTROL

CLINIC NO. ....

C. C. U. NO. ....

NAME (*Last*)	(*First*)	(*Middle*)		DATE	
AGE	DATE OF BIRTH (*Month, year*)	SEX ☐ Male ☐ Female	COLOR	MARITAL STATUS S M W D	WEIGHT

LOCAL EVIDENCE TUMOR DISEASE:

GENERAL PHYSICAL CONDITION:

SKIN:
INSPECTION. PALPATION.

INTRAORAL:
INSPECTION. PALPATION.

NECK:
MASSES. THYROID.
TENDERNESS.

BREASTS:
MASSES. NIPPLE DISCHARGE.
TENDERNESS.

LUNGS:
AUSCULTATION. PERCUSSION.

HEART:
BP. .... P. ....
RYTHM. APEX.
MURMURS.

ADBOMEN:
MASSES. PALPABLE VISCERA.
TENDERNESS. SCARS.
RIGIDITY.

PELVIC:
EXT. GENITALIA. UTERUS.
VAGINA. ADNEXAE.
CERVIX. URETHRA.

MALE GENITALIA:

RECTAL:
ANUS. PROSTATE.
MASSES. HEMORRHOIDS.
TENDERNESS.

BACK AND EXTREMITIES:

LYMPHATIC SYSTEM:

TUMOR DIAGNOSIS:
PROVISIONAL. FINAL.
CYTOLOGICAL.

OTHER DIAGNOSES:
(1)
(2)
(3)

DISPOSITION:

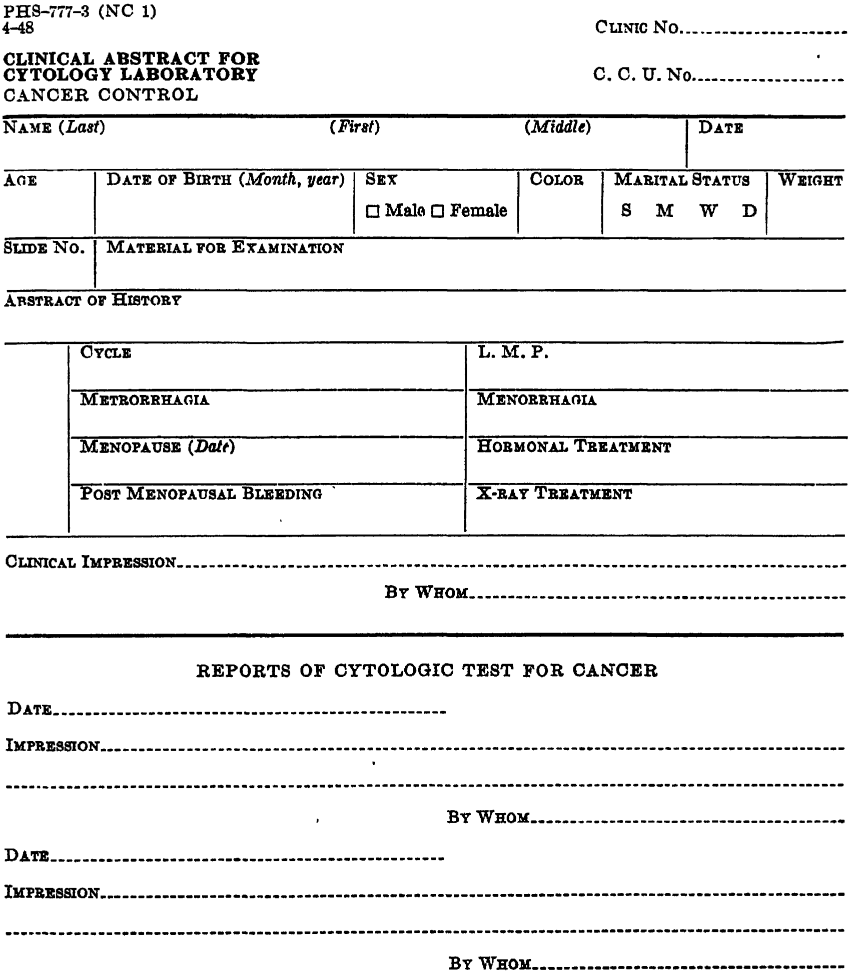
PHYSICAL DONE BY DR. ....

FOLLOW-UP NOTES:

Figure 2

A comprehensive physical examination is then made (fig. 2). It includes inspection of the skin, palpation of the lymph nodes and thyroid, inspection and palpation of the oral cavity, auscultation and percussion of the chest including the precordium, blood pressure determination, careful palpation of the abdomen, breast and pelvic examination in females and a rectal examination in males and females.

A routine vaginal and endocervical smear is prepared from each female patient. Gastric washings and prostatic secretions are now being studied in male examinees for evaluation of the cytologic test (fig. 3) as a screening device for gastric and prostatic carcinoma. A total blood count, serologic test for syphilis, hemoglobin determination and urinalysis are performed routinely.



PHS-777-3 (NC 1)
4-48

CLINICAL ABSTRACT FOR
CYTOLOGY LABORATORY
CANCER CONTROL

CLINIC No.....................

C. C. U. No.....................

NAME (*Last*)	(*First*)	(*Middle*)	DATE

AGE	DATE OF BIRTH (*Month, year*)	SEX ☐ Male ☐ Female	COLOR	MARITAL STATUS S M W D	WEIGHT

SLIDE NO.	MATERIAL FOR EXAMINATION

ABSTRACT OF HISTORY

CYCLE	L. M. P.
METRORRHAGIA	MENORRHAGIA
MENOPAUSE (*Date*)	HORMONAL TREATMENT
POST MENOPAUSAL BLEEDING	X-RAY TREATMENT

CLINICAL IMPRESSION.......................................

BY WHOM.......................................

REPORTS OF CYTOLOGIC TEST FOR CANCER

DATE.......................................

IMPRESSION.......................................

....

BY WHOM.......................................

DATE.......................................

IMPRESSION.......................................

....

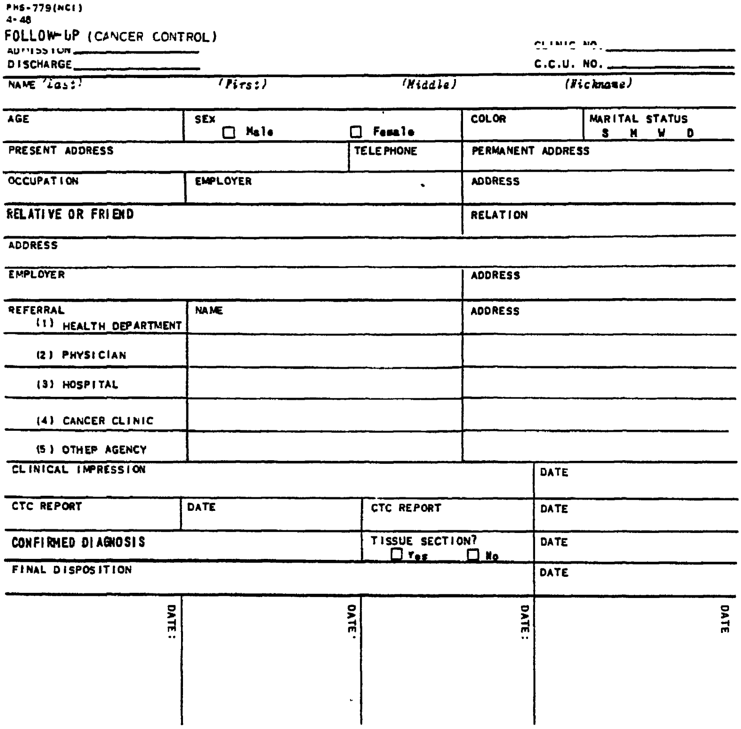
BY WHOM.......................................

Figure 3

Biopsies and other indicated diagnostic procedures are performed where necessary. For example, patients with rectal bleeding, a history of hemorrhoids, or other rectal symptoms are instructed to return the next day, after proper preparation, for proctoscopy.

At the termination of the examination, the examinee is advised by the physician of major abnormalities discovered. Patients under the care of a private physician are advised to report back to this physician for treatment. A complete summary of the case is sent to the family physician.

A routine socio-economic history is elicited before the patients enter the cancer detection unit. The indigent case requiring treatment is referred to the cancer clinic nearest his home. Before leaving the Center, patients requiring treatment are interviewed by the public health nurse who explains in more detail the nature of the diagnosis and emphasizes the need for prompt treatment, while at the same time taking pains to reassure the patient. She has the important duty of completing arrangements for admission to the treatment facility, and maintaining up-to-date follow-up records (fig. 4) on each referred case. A complete summary of referred cases is always sent to the treatment facility.



PHS-779(NCI)
4-48
FOLLOW-UP (CANCER CONTROL)
ADMISSION ____________
DISCHARGE ____________
CLINIC NO. ____________
C.C.U. NO. ____________

NAME (Last) (First) (Middle) (Nickname)

AGE	SEX ☐ Male ☐ Female		COLOR	MARITAL STATUS S M W D
PRESENT ADDRESS		TELEPHONE	PERMANENT ADDRESS	
OCCUPATION	EMPLOYER		ADDRESS	
RELATIVE OR FRIEND			RELATION	
ADDRESS				
EMPLOYER			ADDRESS	
REFERRAL (1) HEALTH DEPARTMENT	NAME		ADDRESS	
(2) PHYSICIAN				
(3) HOSPITAL				
(4) CANCER CLINIC				
(5) OTHER AGENCY				

CLINICAL IMPRESSION			DATE
CTC REPORT	DATE	CTC REPORT	DATE
CONFIRMED DIAGNOSIS		TISSUE SECTION? ☐ Yes ☐ No	DATE
FINAL DISPOSITION			DATE
DATE:	DATE:	DATE:	DATE

Figure 4

Three agencies, the Arkansas State Cancer Commission, the State Health Department, and the University of Arkansas School of Medicine, play important roles in the program. The State Cancer Commission is mainly concerned with the care of indigent cancer cases, and accordingly provides for the treatment of many cases discovered at the Hot Springs project.

The State Health Department largely provides the case load of venereal disease patients through its program of Plantation Surveys, and transports them to the Medical Center. Through its local health units, it is in a position to follow up patients who have not reported to their family physicians as advised, or who do not return to the Medical Center for rechecks at the appointed time.

The University Hospital of the School of Medicine has accepted the majority of indigent patients for treatment. There are also four established cancer clinics in Arkansas which provide limited hospitalization for diagnosis and treatment. The indigent cases discovered in the Medical Center have been referred primarily to these three facilities.

Preliminary Report on Progress

During the first 6 months of operation, 1,500 women have been examined. Of these, 22 were found to have proven cancer, and were successfully referred to treatment sources. Twelve of the cases had early cancer of the cervix, and 7 of the 12 were diagnosed as carcinoma in situ. Six of the total group were under 40 years of age. A number of other patients have been referred for further diagnostic work, and many have been requested to return in 3 months for a recheck because of an equivocal clinical or cytologic impression.

Each of the 1,500 examinees has had at least one pair of slides prepared according to the methods of Papanicolaou and Traut and others, and a total of 300 biopsies were performed. The incidence of major abnormalities other than cancer is running well over 40 percent.

REFERENCES

(*1*) Journal of the National Cancer Institute, 6: 302 (1946).

(*2*) Waters, Charles A. and Kaplan, Ira I.; Introduction on Radiotherapeutics, 1947 Year Book of Radiology, pp. 209–210.

(*3*) Newell, R. R.; Newsletter Am. Coll. of Radiology, (July 1947).

(*4*) Dorn, Harold F.; Illness from cancer in the United States, Reprint No. 2537 from Pub. Health Rep., (May, 1944).

(*5*) L'Esperance, Elise S.; The early diagnosis of cancer, Bull. of the N. Y. Acad. Med., Vol. 23, No. 7 (July 1947).

(*6*) Unpublished survey of cancer detection centers, Am. Cancer Soc. New York City, January-March 1947.

(*7*) White, Benjamin V.; Geschickter, Charles F.; Diagnosis in Daily Practice, J. P. Lippincott and Co., Phila. 1948.

Revised Morbidity Reporting Requirements

The revised morbidity reporting requirements of the Public Health Service will become effective July 1, 1948. Under the new requirements, the reports on mortality which have in the past been sent to the Division of Public Health Methods have been eliminated. The data, instead, will be obtained through the National Office of Vital Statistics from either the death certificates or reports received by that office.

The reports which will no longer be required after July 1, 1948, are as follows:

1. Quarterly Mortality Report from the States—Form 8958–C.
2. Annual Mortality Summary from the States—Form 8964–B.
3. Annual Morbidity Summary from the States—Form 8964–A.
4. Annual Morbidity and Mortality Summary for Cities—Form 8960–B.

Several additions and deletions have been made in the disease categories reportable to the Public Health Service. The revised list of reports and diseases are:

1. Special Telegraphic Report on occurrence of cases of Cholera, Plague, Psittacosis, Epidemic Typhus and Yellow Fever.

2. Weekly Telegraphic Morbidity Report from the States on the number of new cases of the following diseases:

- Anthrax
- Diphtheria
- Encephalitis, infectious
- Influenza
- Meningitis, meningococcal
- Measles
- Paratyphoid fever
- Pneumonia (all forms)
- Poliomyelitis
- Rabies in animals
- Rocky Mountain spotted fever
- Scarlet fever
- Smallpox
- Tularemia
- Typhoid fever
- Whooping cough

Epidemic outbreak of any other disease

3. Monthly Morbidity Report (Form 8958–A) from the States on the total number of newly reported cases of the following diseases:

- Anthrax
- Brucellosis
- Dengue
- Diarrhea of the newborn, epidemic
- Diphtheria
- Dysentery, amebic
- Dysentery, bacillary
- Dysentery, unspecified
- Encephalitis, infectious
- Favus
- Leprosy
- Malaria:
  - acquired in U. S.
  - acquired outside U. S.
- Measles
- Meningitis, meningococcal
- Ophthalmia neonatorum
- Paratyphoid fever
- Pneumonia (all forms)
- Poliomyelitis:
  - bulbar, polioencephalitis, and other paralytic
  - Non-paralytic
  - Unspecified
- Psittacosis
- Rabies in animals
- Rabies in man
- Rheumatic fever
- Ringworm of the scalp
- Rocky Mountain spotted fever
- Smallpox
- Streptococcal diseases:
  - Scarlet fever
  - Septic sore throat

Tetanus
Trachoma
Trichiniasis
Tuberculosis (all forms)
Tuberculosis (respiratory)
Tularemia
Typhoid fever
Typhus fever, endemic
Whooping cough

All other diseases notifiable in the State

4. Each State Health Officer will send two copies of the routine weekly (or monthly) tabulation of reportable diseases by county, which is released by the State Health Department, to the Public Health Service. States not issuing such releases will submit a special form each month giving county totals for the following diseases:

Diphtheria
Encephalitis, infectious
Malaria
Meningitis, meningococcal
Poliomyelitis
Rocky Mountain spotted fever
Smallpox
Tularemia
Typhoid fever
Paratyphoid fever
Typhus fever (endemic, or flea borne)
Undulant fever

5. The health officers in 102 selected cities will submit Post Card Form 8960–A weekly, direct to the Public Health Service, giving the number of new cases of the following diseases:

Anthrax
Diphtheria
Encephalitis, infectious
Influenza
Meningitis, meningococcal
Measles
Poliomyelitis, acute
Pneumonia (all forms)
Rocky Mountain spotted fever
Paratyphoid fever
Scarlet fever
Smallpox
Tularemia
Typhoid fever
Whooping cough

Four-week Summary of Communicable Disease Incidence

April 25–May 22, 1948

The accompanying table summarizes the incidence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in Public Health Reports under the section "Incidence of Disease." The table gives the number of cases of these diseases for the 4 weeks ended May 22, 1948, the number reported for the corresponding period in 1947, and the median number for the years 1943–47.

Diseases Above Median Incidence

Measles.—The number of cases of measles rose from 102,680 during the preceding 4 weeks to 114,983 during the 4 weeks ended May 22. The incidence was 3.4 times the number of cases reported for the corresponding period in 1947, which was, however, a comparatively low measles year, but it was only about 10 percent above the 1943–47 median. In the New England and East South Central sections the incidence was below the normal expectancy and in the South Atlantic section the number of cases was only slightly higher than the median for the preceding 5 years, but in the other 6 sections the increases over the median expectancy ranged from 1.1 times the median in the West North Central section to 3.4 times the median in the West South Central section.

Poliomyelitis.—The number of cases of poliomyelitis rose from 126 during the preceding 4-week period to 440 during the current 4 weeks. The incidence was 3.5 times that reported for these weeks in 1947, which number (126 cases) also represents the 1943–47 median. An increase of this disease is expected at this season of the year, but the current number of cases represents a larger increase at this time than has normally occurred in preceding years. While each section of the country except New England contributed to the relatively high incidence, the greatest excesses over the 5-year medians were reported from the West North Central and West South Central sections. Of the total cases Texas reported 179, California 62, South Carolina 46, New Jersey 16, Iowa 14, Florida 12, Alabama 11, and Illinois, South Dakota, and Louisiana 10 each; 85 percent of the reported cases occurred in those 10 States which represent every section of the country except the New England and Mountain sections. Since the beginning of the year 947 cases of poliomyelitis have been reported as compared with 894 and 810 for the corresponding period in 1947 and 1946, respectively.

Diseases Below Median Incidence

Diphtheria—While the incidence of diphtheria was about the same as during the preceding 4 weeks, the number of cases (611) reported during the four weeks ended May 22 was less than 80 percent of the 1943–47 median for the corresponding periods. In the East South Central section the incidence was about 20 percent above the seasonal expectancy and in the New England section the number reported was normal, but in all other sections the numbers of cases were considerably below the medians for the preceding 5 years. For the country as a whole the current incidence was the lowest on record for these same weeks.

Influenza.—For the current 4 weeks there were 4,575 cases of influenza reported, as compared with 15,461 for the corresponding period in 1947 and a median of 5,272 for the preceding 5 years (1943–47). The number of cases in each section was below the 1947 figure, and the numbers were below the median in all sections except the South Atlantic; in that section the number of cases was 1.2 times the

5-year median. With the exception of the year 1946 when 3,873 cases were reported for these same weeks, the current incidence was the lowest for this period since 1938 when 2,796 cases were reported.

Meningococcus meningitis.—The number of cases (274) of meningococcus meningitis reported for the 4 weeks ended May 22 was less than 85 percent of the number reported for the corresponding period in 1947 and less than 40 percent of the median for the preceding 5 years. After a period of unusually high incidence this disease has dropped to a level more nearly normal for a nonepidemic year, with each section of the country sharing in the favorable situation that now exists. The median for the preceding 5 years contains 3 years of unusually high meningitis incidence; the average incidence for this period during nonepidemic years is approximately 240 cases. A decline in this disease is normally expected at this season of the year, but the decline during the current 4-week period from the preceding 4 weeks was not as great as has occurred in preceding years.

Scarlet fever.—The number of cases of scarlet fever dropped from 8,312 during the preceding 4 weeks to 7,891 during the 4 weeks ended May 22. The number of cases was only slightly below the record low incidence of 1947, but it was 50 percent below the 1943–47 median. In each section of the country the incidence was below the 5-year median expectancy. This disease has been on a gradual decline since 1944; during that year there were approximately 26,000 cases reported during the period corresponding to the one under consideration.

Smallpox.—There were 5 cases of smallpox reported during the current 4-week period, 1 each in Missouri, Kansas, Alabama, Mississippi, and Louisiana. During the corresponding period in 1947 there were 39 cases reported and the 1943–47 median was 41 cases. The East North Central section reported none as compared with a 5-year median of 16, and the West North Central section reported 2 cases as compared with a median of 8 cases, with minor declines from the medians in other sections. For the country as a whole the current incidence was the lowest on record for this period.

Typhoid and paratyphoid fever.—The incidence of these diseases (242 cases) during the current 4 weeks was slightly below the 1947 figure for this period and was about 85 percent of the 1943–47 median. In the South Atlantic section the number of cases (60) was 1.2 times the 5-year median and in the East South Central section the incidence was about normal, but in all other sections the numbers of cases were below the normal expectancy. For the entire country the current incidence was the lowest for this period in the 20 years for which data are available in this form.

Whooping cough.—The number of cases (7,158) of whooping cough was less than 50 percent of the 1947 incidence for the corresponding 4-week period and less than 70 percent of the median for the preceding 5 years. In the West South Central section the number of cases (1,972) was 1.5 times the median expectancy and in the West North Central section the incidence (455 cases) was 1.3 times the normal incidence, but in all other sections the number of cases was lower than the seasonal expectancy.

Mortality, All Causes

For the 4 weeks ended May 22 there was 36,439 deaths from all causes reported to the National Office of Vital Statistics by 93 large cities. The median number for the preceding 3 years was 36,246 deaths. The number of deaths was higher than the median during each of the first 3 weeks of the 4-week period, but during the last week the number of deaths was 2 percent below the median for the corresponding week in the 3 preceding years.

Reported cases of 9 communicable diseases in the United States during the 4-week period Apr. 25–May 22, 1948, the number for the corresponding period in 1947, and the median number of cases reported for the corresponding period, 1943–47

Division	Current period	1947	5-year median	Current period	1947	5-year median	Current period	1947	5-year median
	Diphtheria			Influenza [1]			Measles		
United States	**611**	**785**	**785**	**4,575**	**15,461**	**5,272**	**114,983**	**34,109**	**104,755**
New England	27	52	27	19	62	62	6,720	7,818	8,089
Middle Atlantic	85	177	120	22	33	33	28,603	5,454	14,927
East North Central	104	100	117	114	277	277	28,170	6,942	19,422
West North Central	42	74	74	40	857	102	5,978	3,967	5,337
South Atlantic	124	114	142	1,736	7,254	1,399	6,924	3,771	6,866
East South Central	62	51	52	174	1,371	388	2,046	1,552	2,269
West South Central	92	96	124	2,000	4,484	2,245	11,104	2,066	3,310
Mountain	35	57	57	303	893	461	6,892	1,457	3,724
Pacific	40	64	99	167	230	230	18,546	1,082	7,313
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	**274**	**331**	**712**	**440**	**126**	**126**	**7,891**	**7,989**	**15,612**
New England	8	20	34	0	3	5	1,056	692	2,023
Middle Atlantic	53	53	156	27	14	14	2,348	2,490	4,577
East North Central	59	73	133	23	9	9	2,388	2,303	4,013
West North Central	35	34	49	37	17	6	499	681	1,153
South Atlantic	21	50	93	67	15	16	449	503	1,276
East South Central	33	28	71	16	5	7	151	237	339
West South Central	29	35	68	191	15	26	160	142	319
Mountain	8	3	15	12	5	5	271	319	765
Pacific	28	35	93	67	43	29	569	622	888
	Smallpox			Typhoid and paratyphoid fever			Whooping cough		
United States	**5**	**39**	**41**	**242**	**255**	**281**	**7,158**	**14,589**	**10,548**
New England	0	0	0	15	23	20	397	842	965
Middle Atlantic	0	2	0	18	27	31	900	2,198	2,193
East North Central	0	11	16	36	58	39	891	2,588	1,683
West North Central	2	10	8	7	10	10	455	590	343
South Atlantic	0	2	2	60	31	51	1,059	2,066	1,629
East South Central	2	3	6	27	19	25	367	659	468
West South Central	1	2	4	57	49	64	1,972	3,432	1,341
Mountain	0	9	4	4	6	16	504	597	536
Pacific	0	0	2	18	32	24	613	1,617	1,617

---

[1] New York, North Carolina, and Pennsylvania excluded; New York City and Philadelphia included.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED MAY 29, 1948

Summary

Of the total of 138 cases of poliomyelitis reported for the current week (last week 127, 5-year median 39), 108 occurred in the 6 States reporting more than 4 cases each, as follows (last week's figures in parentheses): Texas 60 (39), North Carolina 14 (13), California 14 (24), South Dakota 10 (9), Georgia 5 (3), and Florida 5 (5). The 8 States reporting more than 11 cases in the 4-week period since May 1 are as follows (figures for the corresponding period last year in parentheses): New Jersey 13 (2), Iowa 13 (3), South Dakota 19 (0), North Carolina 53 (2), Florida 14 (7), Louisiana 12 (2), Texas 195 (12), California 73 (42). The total reported since March 20 (approximate average date of seasonal low incidence) is 730, as compared with a 5-year median of 302 reported for the corresponding period last year. The highest number reported for a corresponding period of the past 5 years was 421, in 1946, and the lowest 236, in 1944.

A total of 26,409 cases of measles was reported, as compared with 29, 319 last week and a 5-year median of 17,935. Significant increases were reported in only a few States. The total for the year to date is 419,563, as compared with 134,454 for the same period last year and a 5-year median of 422,983.

Of the total of 13 cases of Rocky Mountain spotted fever reported (last week 23, 5-year median 9), Illinois, Oklahoma, and Colorado reported 2 each, and New Jersey, South Dakota, Maryland, Virginia, North Carolina, Arkansas, and Wyoming 1 each.

Five cases of anthrax were reported, 2 each in New Jersey and Pennsylvania, and 1 in Louisiana. Of 89 cases of typhoid fever reported (last week 61, 5-year median 68), Texas reported 37 (last week 10).

Deaths recorded for the week in 93 large cities in the United States totaled 8,971, as compared with 8,744 last week, 8,130 and 8,272, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 8,272. The total for the year to date is 215,944, as compared with 215,498 for the same period last year. Infant deaths totaled 674, as compared with 587 last week and a 3-year median of 614. The total to date is 15,076, as compared with 17,218 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended May 29, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	May 29, 1948	May 24, 1947		May 29, 1948	May 24, 1947		May 29, 1948	May 24, 1947		May 29, 1948	May 24, 1947	
NEW ENGLAND												
Maine	4	1	1	------	------	------	23	104	104	0	0	0
New Hampshire	0	0	0	------	------	------	10	2	7	0	0	0
Vermont	0	0	0	------	------	------	10	114	62	0	0	0
Massachusetts	4	3	3	------	------	------	1, 296	405	982	0	2	6
Rhode Island	0	2	0	------	------	------	12	123	60	0	0	0
Connecticut	0	1	0	1	1	1	245	952	473	2	0	2
MIDDLE ATLANTIC												
New York	10	16	16	[1] 4	[1] 14	[1] 3	2, 506	616	616	8	7	26
New Jersey	2	7	3	1	------	5	2, 667	447	925	1	3	11
Pennsylvania	9	13	12	(2)	(2)	[2] 1	1, 828	323	600	1	6	9
EAST NORTH CENTRAL												
Ohio	3	9	9	------	6	7	1, 034	825	745	5	3	8
Indiana	2	1	7	------	4	4	242	117	117	0	0	3
Illinois	2	3	7	8	71	4	807	331	419	3	5	16
Michigan [3]	2	5	5	------	1	1	2, 015	173	886	3	5	5
Wisconsin	1	0	2	10	16	16	1, 765	988	2, 122	0	0	2
WEST NORTH CENTRAL												
Minnesota	1	3	3	------	------	------	281	839	476	0	3	3
Iowa	1	4	2	------	------	------	171	119	226	2	0	1
Missouri	11	4	2	3	1	1	147	43	113	1	2	12
North Dakota	0	1	1	------	------	5	48	125	13	0	1	0
South Dakota	0	1	1	------	1	------	69	136	44	1	0	0
Nebraska	0	1	1	------	------	1	216	6	19	1	0	0
Kansas	2	1	5	2	2	1	59	17	201	0	1	1
SOUTH ATLANTIC												
Delaware	2	0	0	------	------	------	48	1	8	0	0	0
Maryland [3]	1	5	8	------	2	3	804	65	221	1	3	4
District of Columbia	1	0	0	------	1	------	138	9	92	0	0	1
Virginia	0	3	4	89	324	81	210	262	262	3	2	9
West Virginia	1	0	2	2	18	9	74	63	63	0	0	0
North Carolina	10	3	3	------	------	------	32	157	293	1	0	4
South Carolina	4	2	8	220	243	180	306	107	107	1	0	2
Georgia	1	2	2	------	3	6	33	75	75	0	0	1
Florida	5	5	2	6	7	3	210	35	48	0	0	3
EAST SOUTH CENTRAL												
Kentucky	9	8	3	------	------	1	137	22	74	2	2	3
Tennessee	2	5	2	10	79	8	195	44	69	2	7	3
Alabama	6	4	4	12	86	37	39	264	135	*1	1	7
Mississippi [3]	1	6	6	3	24	------	31	19	------	2	3	3
WEST SOUTH CENTRAL												
Arkansas	3	4	3	23	24	10	123	52	52	0	0	3
Louisiana	1	9	2	2	2	2	87	19	34	0	1	1
Oklahoma	0	2	2	22	72	19	70	3	35	0	0	0
Texas	19	13	30	320	428	421	2, 257	406	457	0	4	9
MOUNTAIN												
Montana	0	0	0	1	2	------	41	92	92	0	0	0
Idaho	0	0	0	12	27	------	119	9	21	0	0	0
Wyoming	0	1	0	------	11	------	48	4	56	0	0	0
Colorado	2	3	7	7	41	17	429	64	114	0	0	1
New Mexico	4	3	3	4	1	1	41	89	65	0	0	0
Arizona	4	1	4	37	46	33	346	69	69	1	0	0
Utah [3]	6	0	0	------	2	4	647	12	134	0	0	0
Nevada	0	0	0	------	------	------	------	------	1	0	0	0
PACIFIC												
Washington	5	4	4	------	16	------	720	23	278	2	0	1
Oregon	0	1	1	7	10	5	409	20	69	0	0	1
California	10	15	15	12	24	18	3, 364	166	1, 463	1	6	13
Total	151	175	189	818	1, 610	1, 009	26, 409	8, 956	17, 935	45	67	182
21 weeks	3, 916	5, 392	5, 392	133, 138	295, 843	185, 224	419, 563	134, 454	422, 983	*1, 649	1, 827	4, 704
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	10, 274	12, 958	14, 136	176, 696	328, 818	328, 818	454, 509	157, 341	460, 996	*2, 431	2, 799	7, 156

*Delayed report (included in cumulative totals only): Alabama, meningitis, 2.

[1] New York City only. [2] Philadelphia only. [3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended May 29, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	May 29, 1948	May 24, 1947		May 29, 1948	May 24, 1947		May 29, 1948	May 24, 1947		May 29, 1948	May 24, 1947	
NEW ENGLAND												
Maine	0	0	0	10	8	23	0	0	0	1	0	0
New Hampshire	0	0	0	2	4	11	0	0	0	0	0	0
Vermont	0	0	0	3	12	10	0	0	0	0	0	0
Massachusetts	0	0	0	222	98	286	0	0	0	2	1	2
Rhode Island	0	0	0	3	7	12	0	0	0	0	0	0
Connecticut	0	0	0	31	34	57	0	0	0	0	0	1
MIDDLE ATLANTIC												
New York	2	1	1	[5] 195	289	448	0	0	0	[6] 1	4	2
New Jersey	0	1	0	54	132	132	0	0	0	2	1	1
Pennsylvania	0	0	1	224	223	395	0	0	0	[7] 4	2	5
EAST NORTH CENTRAL												
Ohio	1	1	1	281	192	301	0	1	1	1	8	1
Indiana	1	0	0	38	39	39	0	0	2	0	1	1
Illinois	1	0	0	102	72	179	0	0	0	1	12	2
Michigan [3]	0	0	0	177	135	135	0	0	0	1	1	0
Wisconsin	0	0	0	50	56	244	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	2	0	0	23	39	56	0	0	0	0	0	0
Iowa	4	0	0	47	18	42	0	0	0	0	0	0
Missouri	1	0	0	[5] 11	27	49	0	0	0	3	0	0
North Dakota	0	1	0	2	2	5	0	0	0	2	0	0
South Dakota	10	0	0	6	4	8	0	0	0	0	0	0
Nebraska	1	1	0	8	11	11	0	0	0	1	2	0
Kansas	0	0	1	8	20	45	0	0	0	0	0	1
SOUTH ATLANTIC												
Delaware	0	0	0	1	8	4	0	0	0	1	0	0
Maryland [3]	0	2	0	[5] 29	37	98	0	0	0	0	3	2
District of Columbia	0	0	0	0	7	12	0	0	0	0	0	0
Virginia	2	0	1	5	25	37	0	0	0	[6] 4	3	1
West Virginia	0	0	0	5	10	17	0	0	0	1	1	1
North Carolina	14	1	1	13	20	20	0	0	0	0	1	1
South Carolina	1	0	0	4	4	5	0	0	0	2	1	2
Georgia	5	0	1	14	1	7	0	1	0	[6] 3	4	4
Florida	5	3	3	2	2	3	0	0	0	4	0	3
EAST SOUTH CENTRAL												
Kentucky	0	0	0	4	10	33	0	0	0	2	5	1
Tennessee	2	0	0	21	14	25	0	0	0	4	7	4
Alabama	* 0	1	1	2	5	8	0	0	0	1	2	3
Mississippi [3]	0	2	0	2	0	4	0	0	0	2	1	2
WEST SOUTH CENTRAL												
Arkansas	2	0	1	2	5	4	0	0	0	[7] 2	2	2
Louisiana	2	0	1	2	4	1	0	1	0	[6] 4	2	3
Oklahoma	0	0	0	4	3	4	0	0	0	0	3	1
Texas	60	5	6	31	23	43	0	1	0	37	14	7
MOUNTAIN												
Montana	0	0	0	2	4	14	0	0	0	0	1	0
Idaho	3	0	0	[5] 6	5	18	0	0	0	0	0	1
Wyoming	0	0	0	0	7	6	0	0	0	0	0	0
Colorado	0	0	0	11	28	34	0	0	0	1	0	0
New Mexico	0	0	0	9	3	7	0	0	0	0	1	0
Arizona	3	2	1	1	4	15	0	0	0	0	1	1
Utah [3]	0	0	0	4	7	19	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	2	2	2	33	24	43	0	0	0	0	0	0
Oregon	0	1	0	14	16	26	0	0	0	0	0	1
California	14	10	9	73	113	145	0	0	0	2	4	4
Total	138	34	39	1,791	1,811	3,088	0	4	7	89	88	68
21 weeks	*1,078	914	740	46,711	52,672	82,498	45	131	216	[7] 1,080	1,024	1,236
Seasonal low week [4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	* 730	302	302	69,250	79,358	120,819	66	185	294	[7] 607	539	619

---

*Delayed report (included in cumulative totals only): Alabama, poliomyelitis, 2.

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including cases reported as streptococcal infections and septic sore throat.

[6] Including paratyphoid fever and salmonella infections reported separately, as follows: New York (salmonella infection) 1, Virginia 1, Georgia 3, Louisiana 2.

[7] Correction (deducted from cumulative totals): Typhoid fever, Pennsylvania, week ended March 20, 2 cases (instead of 3); Arkansas, week ended May 8, 3 cases (instead of 4).

Telegraphic morbidity reports from State health officers for the week ended May 29, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended May 29, 1948							
	Week ended—		Median 1943-47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	May 29, 1948	May 24, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	3	6	6								
New Hampshire	3		3								
Vermont	24	9	12								1
Massachusetts	29	127	118		4						2
Rhode Island	9	21	20								
Connecticut	15	53	53								1
MIDDLE ATLANTIC											
New York	69	199	199	15	4		3				3
New Jersey	48	235	117	3				1			
Pennsylvania	43	159	159		1						
EAST NORTH CENTRAL											
Ohio	36	174	94	4							8
Indiana	8	62	30		1						3
Illinois	31	85	85	4	4		1	2			12
Michigan [3]	21	274	108	20							3
Wisconsin	44	136	98								14
WEST NORTH CENTRAL											
Minnesota	11	50	20		1						1
Iowa	14	11	11	2			1				1
Missouri	18	35	18								5
North Dakota	1	4	2								
South Dakota		2	2					1			2
Nebraska	1	11	5	1							3
Kansas	36	37	37								3
SOUTH ATLANTIC											
Delaware		2	1								
Maryland [3]	3	88	55			1		1			3
District of Columbia	3	1	8								
Virginia	49	61	80			24		1	3		3
West Virginia	11	38	21								
North Carolina	29	94	147					1			1
South Carolina	117	142	91		11				1		1
Georgia	13	82	13		1	1				2	3
Florida	28	47	22	2						1	2
EAST SOUTH CENTRAL											
Kentucky	46	50	50				1				1
Tennessee	24	58	58	10			1				2
Alabama	33	37	35	(*)						1	1
Mississippi [3]	2	25							5	1	3
WEST SOUTH CENTRAL											
Arkansas	23	26	18	12		48		1	7		3
Louisiana	1	21	9	5					1	2	1
Oklahoma	12	15	15	5				2	2		2
Texas	351	983	263	37	493	97			6	8	26
MOUNTAIN											
Montana	4	10	6						1		
Idaho	5	31	3								
Wyoming	1	3	1					1	1		
Colorado	28	33	23					2			9
New Mexico	15	15	10								
Arizona	36	51	23			77	1				
Utah [3]	18	7	43								2
Nevada											
PACIFIC											
Washington	28	22	24								1
Oregon	48	16	27	9							
California	63	347	347	4	2		1				2
Total	1,455	3,995	2,540	133	525	248	9	13	27	15	128
Same week, 1947	3,995			64	351	140	5	17	23	25	101
Median, 1943–47	2,540			33	375	117	10	9	20	54	[8]101
21 weeks: 1948	43,471			*1,565	6,575	3,956	186	65	388	299	1,920
1947	59,710			1,016	6,212	4,095	140	63	644	774	2,203
Median, 1943–47	52,392			628	6,212	2,255	177	63	364	963	[8]1,86

[3] Period ended earlier than Saturday.

[8] 3-year median 1945–47.

*Delayed report (included in cumulative totals only): Alabama, amebic dysentery 1.

Anthrax: New Jersey, 2; Pennsylvania, 2; Louisiana, 1. *Leprosy:* Louisiana, 2.

Alaska, week ended May 22, measles 2; week ended May 29, measles 8, meningitis 1, mumps 1, pneumonia 5, rheumatic fever 1, scarlet fever 2.

Territory of Hawaii: week ended May 29: Rabies 0, bacillary dysentery 6, measles 6, scarlet fever 7, whooping cough 11.

WEEKLY REPORTS FROM CITIES*

City reports for week ended May 22, 1948

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	2	0	------	0	1	0	2	0	1	0	0	------
New Hampshire:												
Concord	0	0	------	0	2	0	2	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	-------	0	0	0	0	0	0	------
Massachusetts:												
Boston	1	0	------	1	255	1	11	0	107	0	2	6
Fall River	0	0	------	0	32	0	0	0	2	0	0	------
Springfield	0	0	------	0	7	0	0	0	2	0	0	------
Worcester	0	0	------	0	31	0	8	0	3	0	0	4
Rhode Island:												
Providence	0	0	1	0	17	0	5	0	8	0	0	1
Connecticut:												
Bridgeport	0	0	------	0	1	0	0	0	3	0	0	1
Hartford	0	0	------	0	5	0	0	0	0	0	0	------
New Haven	0	0	------	0	8	0	0	0	4	0	0	5
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0	------	0	69	0	4	0	15	0	0	3
New York	7	0	9	0	1,445	2	48	0	59	0	0	22
Rochester	0	0	------	0	2	1	7	0	11	0	0	------
Syracuse	0	0	------	0	12	0	0	0	10	0	0	7
New Jersey:												
Camden	0	0	------	0	22	0	3	0	0	0	0	------
Newark	0	0	1	0	445	0	0	0	7	0	0	2
Trenton	0	0	------	0	3	0	3	0	1	0	0	------
Pennsylvania:												
Philadelphia	4	0	2	2	1,062	1	13	0	56	0	1	9
Pittsburgh	0	0	------	0	22	0	5	0	70	0	0	3
Reading	0	0	------	1	12	0	2	0	6	0	0	3
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	149	1	2	0	7	0	0	4
Cleveland	0	0	------	1	49	1	4	2	30	0	0	5
Columbus	0	0	------	0	29	0	0	0	4	0	0	------
Indiana:												
Fort Wayne	0	0	------	0	8	0	0	0	4	0	0	------
Indianapolis	2	0	------	0	226	0	1	0	1	0	0	3
South Bend	0	0	------	0	6	0	0	0	4	0	0	2
Terre Haute	0	0	------	0	-------	0	0	0	0	0	0	------
Illinois:												
Chicago	1	0	------	0	333	6	15	0	34	0	0	13
Springfield	0	0	------	0	5	0	3	0	0	0	0	4
Michigan:												
Detroit	1	5	------	0	724	1	6	0	0	0	0	5
Flint	0	0	------	0	22	0	0	0	3	0	0	------
Grand Rapids	0	0	------	0	6	1	0	0	5	0	0	2
Wisconsin:												
Kenosha	0	0	------	0	67	0	0	0	0	0	0	------
Milwaukee	0	0	------	0	209	0	3	0	18	0	0	4
Racine	0	0	------	0	25	0	0	0	2	0	0	3
Superior	0	0	------	0	120	0	0	0	0	0	0	------
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	217	0	1	0	3	0	0	------
Minneapolis	1	0	------	0	13	0	3	0	13	0	0	2
St. Paul	0	0	------	0	33	0	2	2	7	0	1	4
Missouri:												
Kansas City	0	0	4	0	32	0	2	0	5	0	0	12
St. Joseph	0	0	------	0	11	0	0	0	0	0	0	------
St. Louis	1	0	1	0	59	1	1	1	7	0	1	5

*In some instances the figures include nonresident cases.

City reports for week ended May 22, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	1	37	0	1	1	1	0	0	2
Kansas:												
Topeka	0	0	------	0	9	0	1	0	0	0	0	------
Wichita	0	0	------	0	8	0	4	0	1	0	0	4
SOUTH ATLANTIC												
Maryland:												
Baltimore	4	0	------	0	573	0	1	0	6	0	0	9
Cumberland	0	0	------	0	------	0	0	0	1	0	0	------
Frederick	1	0	------	0	------	0	1	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	123	1	3	0	7	0	0	3
Virginia:												
Lynchburg	0	0	------	0	------	0	1	0	0	0	0	------
Richmond	0	0	------	1	11	0	2	0	3	0	0	1
Roanoke	0	0	------	0	1	0	0	0	2	0	0	------
West Virginia:												
Charleston	0	0	------	0	8	0	6	0	0	0	0	------
Wheeling	0	0	------	0	------	0	1	0	0	0	0	------
North Carolina:												
Raleigh	0	0	------	0	1	0	0	0	0	0	0	------
Wilmington	0	0	------	0	------	0	0	0	2	0	0	3
Winston-Salem	0	0	------	0	------	0	3	1	0	0	0	------
South Carolina:												
Charleston	0	0	6	0	1	0	2	0	1	0	0	14
Georgia:												
Atlanta	0	0	------	0	4	0	0	0	3	0	0	1
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Savannah	0	0	------	0	10	0	0	1	2	0	0	------
Florida:												
Tampa	1	0	------	0	14	0	3	0	2	0	0	1
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	1	24	1	6	0	1	0	0	5
Nashville	0	0	------	0	6	0	2	0	2	0	0	1
Alabama:												
Birmingham	1	0	------	0	------	0	0	0	5	0	1	1
Mobile	0	0	------	0	------	0	1	0	2	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	2	0	10	0	0	0	0	0	0	3
Louisiana:												
New Orleans	1	0	------	0	------	0	5	1	1	0	2	------
Shreveport	0	0	------	0	------	0	2	0	1	0	0	------
Oklahoma:												
Oklahoma City	0	0	------	0	1	0	3	0	0	0	0	------
Texas:												
Dallas	1	0	------	0	127	1	4	1	8	0	1	2
Galveston	0	0	------	0	1	0	2	2	1	0	0	------
Houston	0	0	3	1	2	0	2	8	1	0	2	------
San Antonio	1	0	------	0	10	0	6	2	0	0	0	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	------	0	1	0	0	0	0	------
Great Falls	0	0	------	0	------	0	1	0	0	0	0	------
Helena	0	0	------	0	1	0	0	0	0	0	0	------
Missoula	0	0	------	0	1	0	0	0	0	0	0	------
Idaho:												
Boise	0	0	------	0	------	0	1	0	0	0	0	------
Colorado:												
Denver	3	0	1	0	166	1	5	0	7	0	0	14
Pueblo	0	0	------	0	75	0	1	0	3	0	0	1
Utah:												
Salt Lake City	1	0	------	0	232	0	0	0	6	0	0	3

City reports for week ended May 22, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	271	0	7	1	0	0	0	3
Spokane	0	0	------	0	6	0	2	0	1	0	0	------
Tacoma	0	0	------	0	16	0	0	0	4	0	0	------
California:												
Los Angeles	1	0	5	0	403	0	1	6	13	0	0	3
Sacramento	0	0	------	0	50	0	3	0	0	0	0	6
San Francisco	2	0	2	0	177	0	8	0	17	0	0	------
Total	38	5	37	9	8,175	20	248	29	616	0	11	215
Corresponding week, 1947[1]	62	------	42	11	2,826	------	284	------	655	0	12	957
Average 1943–47	60	------	42	[2] 12	[3] 4,760	------	[2] 284	------	1,244	0	13	694

[1] Exclusive of Oklahoma City. [2] 3-year average, 1945–47. [3] 5-year median, 1943–47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (latest available estimated population, 34,485,700)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Tyhpoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	7.8	0.0	2.6	2.6	938	2.6	73.2	0.0	340	0.0	5.2	44
Middle Atlantic	5.6	0.0	5.6	1.4	1,432	1.9	39.3	0.0	109	0.0	0.5	23
East North Central	2.4	3.0	0.0	0.6	1,203	6.1	20.7	1.2	68	0.0	0.0	27
West North Central	4.0	0.0	10.1	2.0	843	2.0	30.2	8.0	74	0.0	4.0	58
South Atlantic	10.2	0.0	10.2	1.7	1,266	1.7	39.0	3.4	49	0.0	0.0	54
East South Central	5.9	0.0	0.0	5.9	177	5.9	53.1	0.0	59	0.0	5.9	41
West South Central	7.6	0.0	12.7	2.5	384	2.5	61.0	35.6	30	0.0	12.7	15
Mountain	31.8	0.0	7.9	0.0	3,773	7.9	71.5	0.0	127	0.0	0.0	143
Pacific	4.7	0.0	11.1	0.0	1,460	0.0	33.2	11.1	55	0.0	0.0	19
Total	5.8	0.8	5.6	1.4	1,239	3.0	37.6	4.4	93	0.0	1.7	33

Dysentery, amebic.—Cases: New York, 7; Memphis 2; New Orleans 2; Los Angeles 3.
Dysentery, bacillary.—Cases: Worcester 7; New York 4; Charleston, S. C. 1; New Orleans 1; Los Angeles 3.
Dysentery, unspecified.—Cases: San Antonio 79.
Rocky Mountain spotted fever.—Cases: St. Louis 1; Nashville 1; Washington 1.
Tularemia.—Cases: Missoula City 1.
Typhus fever, endemic.—Cases: Tampa 1.

PLAGUE INFECTION IN NEW MEXICO AND TEXAS

Under dates of May 25 and 28 plague infection was reported proved in pools of fleas from rodents in New Mexico and Texas, as follows:

NEW MEXICO

Catron County.—A pool of 120 fleas from 18 grasshopper mice, *Onychomys leucogaster*, trapped May 14 on State Highway No. 12, 10 miles southwest of Datil.

Rio Arriba County.—Pools of fleas from prairie dogs, *Cynomys gunnisoni gunnisoni*, as follows: 80 fleas from 12 prairie dogs shot

May 11 on a ranch 4½ miles southeast of Parkview on State Highway No. 95; 14 fleas from 16 prairie dogs, shot on a ranch 13 miles west of Parkview on State Highway No. 95; 46 fleas from 3 prairie dogs shot 7 miles east of Dulce, on State Highway No. 17.

Socorro County.—A pool of 89 fleas from 35 wood rats, *Neotoma albigula,* trapped May 6 in the Cibola National Forest, on State Highway No. 52, 6 miles north of a point 10 miles west of Magdalena.

TEXAS

Gaines County.—Pools of fleas from pack rats, *Neotoma micropus,* taken at locations distant from Cedar Lake, as follows: One mile southeast, April 6 and 7, a pool of 137 fleas and a pool of 126 fleas from 38 rates; 2¼ miles southeast, April 13, a pool of 22 fleas from 12 rats; 2 miles southeast, April 14 and 15, a pool of 86 fleas from 22 rats; 5 miles south of White City at Cedar Lake and 1 mile east, a pool of 43 fleas from 3 rats.

These are the first findings of plague infection in Gaines County although it has been previously reported in adjacent Dawson County.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended May 8, 1948.—During the week ended May 8, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		32	1	168	284	53	24	12	101	675
Diphtheria				11		1	2			14
Dysentery:										
Amebic						1		1		2
Bacillary				2						2
Encephalitis, infectious								1		1
German measles				34	12	6	6	6	5	69
Influenza		14			23	37			1	75
Measles			3	740	1,127	16	11	51	85	2,033
Meningitis, meningococcus						1				1
Mumps		9		250	250	69	76	43	16	713
Poliomyelitis					1					1
Scarlet fever		2	1	56	63	6		1	6	135
Tuberculosis (all forms)		10	34	113	45	38	16	7		263
Typhoid and paratyphoid fever				11	1		1			13
Undulant fever				2		1		1		4
Venereal diseases:										
Gonorrhea	2	15	9	77	53	19	21	35	55	286
Syphilis	1	7	4	44	57	7	2	4	14	140
Whooping cough				53	16	8	3	59	9	148

JAPAN

Notifiable diseases—4 weeks ended May 1, 1948, and accumulated totals for the year to date.—For the 4 weeks ended May 1, 1948, and for the year to date, certain notifiable diseases were reported in Japan as follows:

Disease	4 weeks ended May 1, 1948		Total reported for the year to date	
	Cases	Deaths	Cases	Deaths
Diphtheria	1, 409	117	6, 962	712
Dysentery, unspecified	342	83	956	214
Encephalitis, Japanese "B"	1	----------	1	----------
Gonorrhea	23, 756	----------	87, 930	----------
Influenza	416	----------	1, 799	----------
Malaria	308	1	1, 086	7
Measles	6, 965	----------	21, 391	----------
Meningitis, epidemic	244	60	881	217
Paratyphoid fever	179	7	624	31
Pneumonia	15, 049	----------	70, 109	----------
Scarlet fever	265	4	927	12
Smallpox	7	0	15	0
Syphilis	22, 453	----------	80, 690	----------
Tuberculosis	33, 544	----------	110, 711	----------
Typhoid fever	489	57	1, 870	240
Typhus fever	165	9	406	29
Whooping cough	3, 419	----------	13, 633	----------

NOTE.—The above figures have been adjusted to include delayed and corrected reports.

MEXICO

Mexico-Texas Border—Poliomyelitis.—Under date of May 26 an outbreak of poliomyelitis was reported in Reynosa, State of Tamaulipas, Mexico, with 12 cases and 1 death to that date. The locality is across the Rio Grande from Hidalgo and Cameron Counties, Texas, where an unusual incidence of the disease has recently been reported.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

Pakistan—Lahore.—Cholera has been reported in Lahore, City and District, Pakistan, as follows: week ended April 17, 1948, 95 cases with 32 deaths; week ended April 24, 1948, 924 cases with 153 deaths.

Plague

British East Africa—Tanganyika—Singida District.—Information dated May 25, 1948, states that the outbreak of bubonic plague in Singida District, Tanganyika, British East Africa, which commenced early in February, is now regarded as terminated. A total of 262 cases with 147 deaths was recorded during the epidemic period.

India—East Punjab Province—Ambala District.—During the period January 1–May 8, 1948, 178 cases of plague with 58 deaths have been reported in the villages of Ambala District, East Punjab Province, India. This District is stated to be approximately 100 miles north of Delhi.

Smallpox

China—Shanghai.—Smallpox has been reported in Shanghai, China, as follows: Week ended May 8, 1948, 52 cases with 9 deaths; week ended May 15, 1948, 73 cases. During the period January 1–May 15, 1948, 1,970 cases with 488 deaths have been reported in Shanghai.

French West Africa—Ivory Coast.—For the period May 1–10, 1948, 105 cases of smallpox with 30 deaths were reported in Ivory Coast, French West Africa.

India—Calcutta.—Smallpox has been reported in Calcutta, India, as follows: Week ended May 8, 1948, 55 cases with 49 deaths; week ended May 15, 1948, 39 cases with 31 deaths. During the period January 1–May 15, 1948, 6,023 cases with 4,893 deaths were reported in Calcutta.

Sudan (Ango-Egyptian)—Kordofan Province.—An outbreak of smallpox has been reported in Kordofan Province, Anglo-Egyptian Sudan. Reports of cases and deaths have been received as follows: Week ended April 24, 1948, 34 cases with 7 deaths, including 25 cases, 6 deaths in the city of El Obeid; week ended May 1, 45 cases with 11 deaths, including 42 cases, 11 deaths in El Obeid; week ended May 8, 60 cases with 13 deaths, including 55 cases, 13 deaths in El Obeid.

Typhus Fever

Egypt.—During the period April 1–30, 1948, 134 cases of typhus fever with 18 deaths were reported in Egypt.

Japan—Osaka.—During the week ended April 17, 1948, 99 cases of typhus fever were reported in Osaka, Japan.

DEATHS DURING WEEK ENDED MAY 22, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended May 22, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	8,744	8,923
Median for 3 prior years	8,923	
Total deaths, first 21 weeks of year	206,973	207,368
Deaths under 1 year of age	587	698
Median for 3 prior years	638	
Deaths under 1 year of age, first 21 weeks of year	14,402	16,539
Date from industrial insurance companies:		
Policies in force	71,081,927	67,305,638
Number of death claims	13,486	12,279
Death claims per 1,000 policies in force, annual rate	9.9	9.5
Death claims per 1,000 policies, first 21 weeks of year, annual rate	10.1	10.0

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued in reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948

For sale by the Superintendent of Documents, United States Government Printing Office, Washington 25 D. C. Price 10 cents. Subscription price $4.00 a year.

Public Health Reports

VOLUME 63 JUNE 25, 1948 NUMBER 26

IN THIS ISSUE

The National Mental Health Program

Studies of Acute Diarrheal Diseases—Salmonellosis

1798

FEDERAL SECURITY AGENCY

PUBLIC HEALTH SERVICE

FEDERAL SECURITY AGENCY
Oscar R. Ewing, Administrator

PUBLIC HEALTH SERVICE
Leonard A. Scheele, Surgeon General

Division of Public Health Methods
G. St. J. Perrott, Chief of Division

CONTENTS

Page
The National mental health program—A progress report. Robert H. Felix 837
Studies of the acute diarrheal diseases. XXI. Salmonellosis in Florida. Mildred M. Galton and Albert V. Hardy 847
Deaths during week ended May 29, 1948 851

INCIDENCE OF DISEASE

United States:
  Reports from States for week ended June 5, 1948, and comparison with former years 852
  Weekly reports from cities:
    City reports for week ended May 29, 1948 856
    Rates, by geographic divisions, for a group of selected cities 858
Plague infection in Catron and Rio Arriba Counties, New Mexico 858
  Territories and possessions:
    Panama Canal Zone—Notifiable diseases—April 1948 859
Foreign reports:
  Canada—Provinces—Communicable diseases—Week ended May 15, 1948 860
  World distribution of cholera, plague, smallpox, typhus fever, and yellow fever—
    Cholera 860
    Plague 861
    Smallpox 862
    Typhus fever 863
    Yellow fever 864

Public Health Reports

Vol. 63 • JUNE 25, 1948 • *No. 26*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

THE NATIONAL MENTAL HEALTH PROGRAM[1]

—A PROGRESS REPORT—

By Robert H. Felix, *Chief, Mental Hygiene Division, Public Health Service*

A year ago the State mental health authorities met with the State and Territorial health officers for the first time to discuss ways of working together to improve the mental health of the Nation. By that time Congress had passed the National Mental Health Act, but there were no funds to implement it and that meeting was confined largely to a discussion of plans for carrying out the provisions of the Act when funds were appropriated.

Today, less than 5 months after funds became available to put the Act into operation, a vigorous, nationwide mental health program has been initiated, thanks to the enthusiastic participation of the State authorities and other interested organizations and individuals. This presentation is essentially a progress report of your mental health programs—of what has been accomplished by the States in implementing the plans envisaged at the last meeting.[2]

STATE MENTAL HEALTH AUTHORITIES

To begin with, in July 1947 Congress appropriated $3,000,000 for grants-in-aid to States to assist them in establishing and improving the mental health services in their communities. Each State was asked to designate a State mental health authority, the one agency with which the Public Health Service will deal in this program. All States have now done so. In 32 States and Territories the mental health authority is the State health department. In others it is the department of welfare, of institutions, of mental hygiene, or some other State agency.

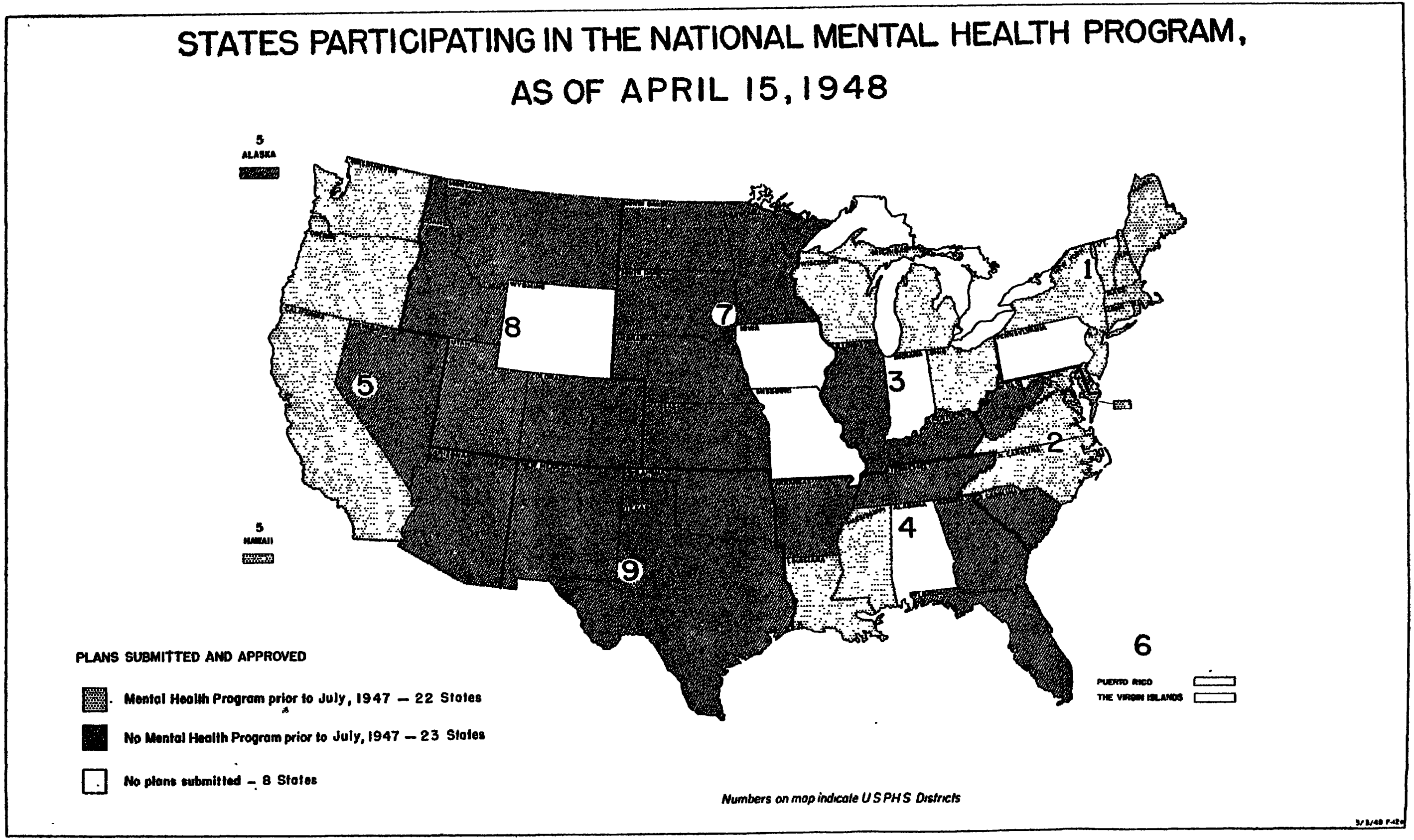
To receive a grant the State mental health authority must submit a plan and budget, covering the entire State, for approval by the Surgeon General. To date, 42 States and Territories[3] have submitted plans which have been approved by the Surgeon General (see figure 1). Of these, 21 had no State mental health program prior to July 1947.

---

[1] Presented at the State and Territorial health officers meeting Washington, D. C., December 2, 1947.

[2] Corrected to January 1, 1948.

[3] 45 States and territories as of April 15, as shown in figure 1.



STATES PARTICIPATING IN THE NATIONAL MENTAL HEALTH PROGRAM, AS OF APRIL 15, 1948

5
ALASKA
5
HAWAII
1
2
3
4
5
6
7
8
9
PUERTO RICO
THE VIRGIN ISLANDS
PLANS SUBMITTED AND APPROVED
Mental Health Program prior to July, 1947 – 22 States
No Mental Health Program prior to July, 1947 – 23 States
No plans submitted – 8 States
Numbers on map indicate U S P H S Districts

FIGURE 1

STATE PLANS

As is to be expected, the mental health programs planned by the various States differ widely, depending upon the degree of development of mental health services in a State prior to the Act, the availability of personnel, the accessibility of teaching centers, and many other factors. Despite the disparity among States, most of the plans submitted contained provisions for all or some of the following mental health activities: Central administrative services; training; clinics; professional services; and preventive and educational activities (see figure 2).

Central Administrative Services

Thirty-five States and Territories have provided for central administrative services. These include such activities as development and maintenance of a roster of mental health facilities (28 States) and of the mentally handicapped (18 States); inspection and licensing of hospitals and other mental health facilities (14 States); and studies of special problems related to mental health (30 States).

Training

The dearth of mental health facilities in many sections of the country is due in large part not only to the nation-wide shortage of trained mental health personnel but also to their unequal distribution, since most of them are concentrated, by and large, in metropolitan centers.

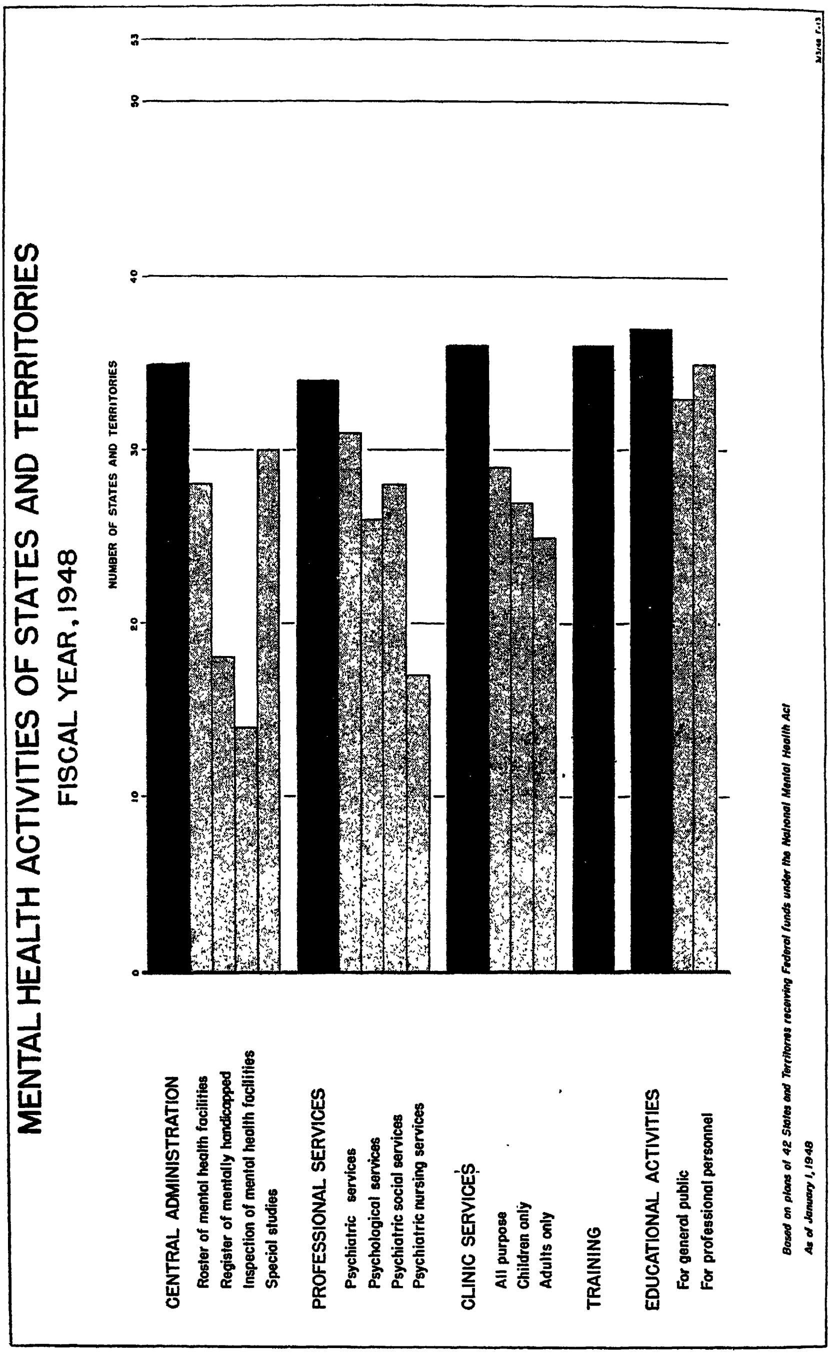
This problem can be solved in part through the States' own efforts. States may use grant-in-aid funds to train persons who, upon completion of their training, will spend a substantial portion of their time in mental health activities not related to patients in institutions.

It is good to note that States are taking advantage of this opportunity. Thirty-six States and Territories have included in their plans provisions for such training. Funds are being used by these States to train psychiatrists (they may not be used for undergraduate medical training), and psychiatric social workers, clinical psychologists and psychiatric nurses, to work in the State mental health program.

A number of States are also holding institutes and seminars in mental hygiene for public health nurses, and some are paying their expenses to attend institutes in other States. A few States are planning mental hygiene seminars and brief courses of study for other professional personnel employed by the State.

Clinics

Thirty-six of the 42 States and Territories which have submitted plans are initiating or expanding community mental health clinics. Twenty-nine will furnish all-purpose clinics available to every segment of the population; 27, clinics for children; and 25, clinics for adults.


MENTAL HEALTH ACTIVITIES OF STATES AND TERRITORIES

FISCAL YEAR, 1948

Based on plans of 42 States and Territories receiving Federal funds under the National Mental Health Act

As of January 1, 1948

FIGURE 2

A few of the specialized clinics (for children or adults) will furnish only diagnostic and consultative services.

The auspices under which clinics will operate vary. Many of the States are organizing clinics under the State health department or some other State agency. Some are conducting clinics under the auspices of their State hospital. A few aim to make mental health services more widely available by subsidizing private non-profit clinics.

Since the scope and functions of a clinic were described in some detail last year, they will not be repeated here. It should be reiterated, however, that the success of a clinic depends upon the active support of the community; therefore, the cooperation of mental hygiene societies and other community groups, as well as of public and professional organizations, should be obtained in planning for and sponsoring a clinic.

Professional Services

While clinics are a necessary part of a mental health program, they are by no means the most important element. Moreover, the operation of a clinic requires more trained personnel than many States can muster at this time. To make the widest use of the limited personnel available, 34 States and Territories are using Federal funds to employ mental health personnel who can serve, either part-time or full-time, in a consultant, supervisory, or service capacity to State and community health and welfare agencies. Thirty-one States and Territories plan to provide psychiatric service; 26, psychological service; 28, psychiatric social service; 17, psychiatric nursing service. A number of States plan to provide direct mental health services to patients by a public health nurse.

Preventive and Educational Activities

Education of the public to the facts of mental health and mental illness is essential to the success of a mental health program. State and local health and welfare agencies can do much to disseminate these facts. They can also help by cooperating with their State and local mental hygiene societies and other interested citizen groups in their educational campaigns.

It is encouraging to note that 37 States and Territories have included in their plans provisions for preventive and educational activities. These include mental health programs in schools, college and community groups, such as parent-teacher associations, women's clubs, and civic organizations; the education of mothers to mental health principles in pre-natal and well-baby clinics; institutes for public health nurses, teachers, social workers, ministers, probation officers, and others who deal with people in a professional capacity; and dissemination of mental health information to the general public.

The total amount budgeted by the States thus far for these mental health activities is $1,965,519 (see figure 3). Sixty-two percent of the funds in the approved budgets have been allocated by the States for mental health activities to be carried on directly by the State mental health authorities. These include 42 percent for clinics, 17 percent for professional services, 2 percent for central administration, and 1 percent for preventive and educational activities.

Twenty-four percent of the approved budgets have been allocated for mental health activities financially supported, but not directly operated, by the State mental health authority. These include 20 percent for clinics, 2 percent for professional services, and 2 percent for preventive and educational activities. And 14 percent has been allocated for the training of personnel to work in the State and community mental health programs.

THREE STATE PROGRAMS

To give a concrete picture of the various ways in which grant-in-aid funds are being used, a brief summary is presented of three State programs: Virginia, California, and Montana.

Virginia has set up a comprehensive program for a State-wide system of mental health services. The State has been divided into 13 areas, in each of which at least one mental hygiene clinic will be located. A psychiatrist and a psychologist will serve two or three clinics, traveling from one area to another, while a psychiatric social worker will remain in each area to act as case consultant to local agencies, in addition to carrying the case-load of the clinic. Statistical reports from each clinic will be sent to a central office where a roster of patients will be kept.

As the need becomes apparent and as personnel become available the clinic teams will be both enlarged and increased in number, with possibly 75 clinics as the eventual goal. Local participation, financial and otherwise, is required in the operation of area programs.

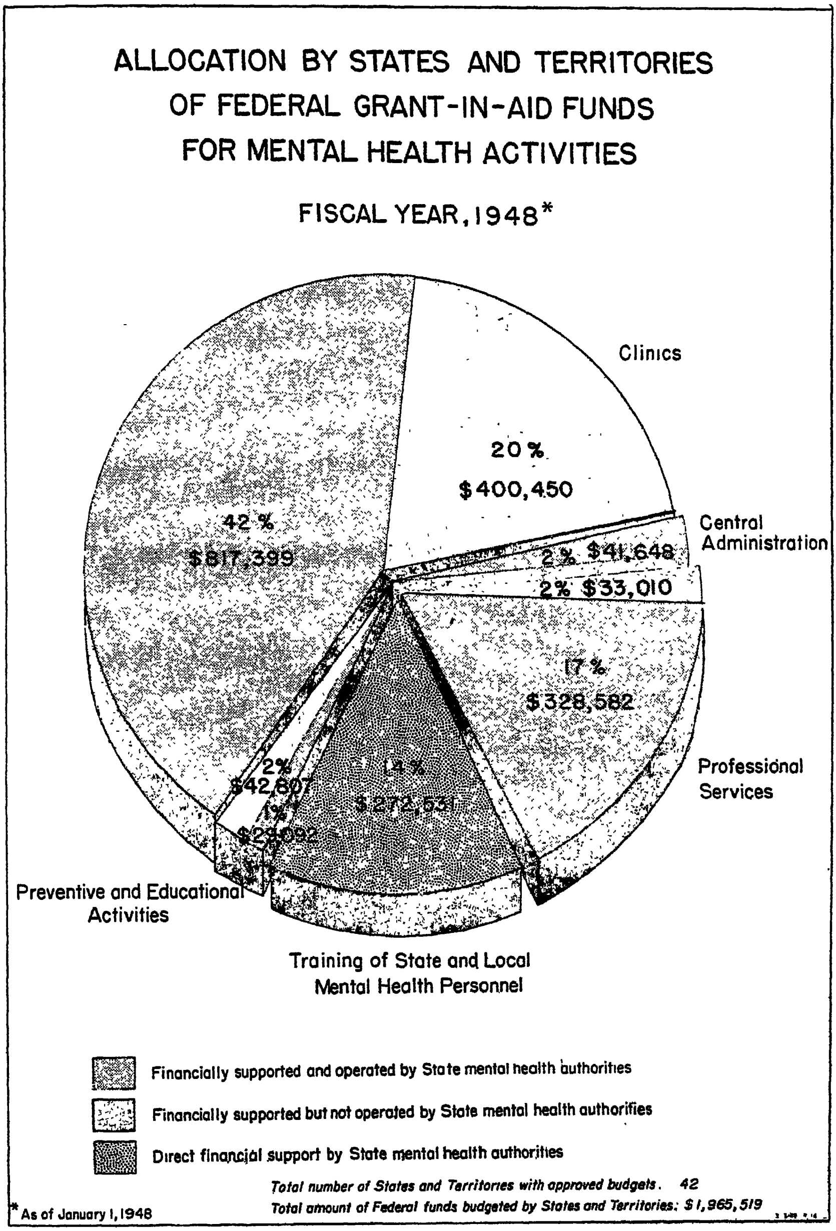
At the present time Virginia is conducting nine mental hygiene clinics, two of which are part-time, under the auspices of the State hospital system. Federal funds will be used this year to expand the clinics now in operation and to support the establishment of two new ones. The State hopes to increase its mental health staff to 29—4 psychiatrists, 9 psychiatric social workers, 5 psychologists, and 11 clerical workers.

A small amount of the allotment will be used for central administrative activities, including the maintenance of a roster of the mentally handicapped and of the mental health resources in the State, and the licensing of mental health facilities.

---

[4] Corrected to January 1, 1948.

This plan represents the initial steps in a continuing, long-range program covering the entire State. The program is centrally controlled, the State mental health authority having direct supervision over the various out-patient clinics and services within the State.



ALLOCATION BY STATES AND TERRITORIES OF FEDERAL GRANT-IN-AID FUNDS FOR MENTAL HEALTH ACTIVITIES

FISCAL YEAR, 1948*

- ▨ Financially supported and operated by State mental health authorities
- ▨ Financially supported but not operated by State mental health authorities
- ▨ Direct financial support by State mental health authorities

Total number of States and Territories with approved budgets. 42

Total amount of Federal funds budgeted by States and Territories: $1,965,519

*As of January 1, 1948

FIGURE 3

In contrast to Virginia's program is that of California. Mental health activities in California are conducted by two State agencies, the Department of Mental Hygiene and the Department of Public Health. The latter has been designated as the State mental health authority.

The Department of Public Health is responsible for preventive mental health activities and the development of mental health services as an integral part of the public health program. The Department of Mental Hygiene is responsible for the operation of all mental institutions in the State, for community clinics, for the inspection and approval of community mental health facilities, and for the education and training of personnel in connection with its program. A close liaison exists between the two departments.

At the present time the California Department of Public Health has one psychiatrist on its staff. He serves as a consultant to the professional staff of the department and to local health offices, assisting them in establishing local mental health services and in developing training programs for their staffs. He also consults with community agencies and citizen groups which are interested in obtaining mental health services and educational programs for their community. With funds available under the National Mental Health Act, it is planned that this psychiatrist will conduct lectures, seminars, and a course of study in mental health for the administrative staff of the State health department. He will also conduct short-term teaching programs for any local health department which requests them. A public health nurse with advanced training in pediatrics and mental hygiene will work closely with him, providing educational and consultative services to the nursing staff of local health departments.

Approximately one-sixth of California's allotment will be spent directly by the State health department for administrative expenses, salaries, and the training and consultative services described. The remainder of the funds will be used for local mental health activities.

Two county health departments will each receive funds to employ a psychiatric social worker. One social worker will participate in maternal and child health conferences and in monthly mental hygiene clinics held in the major communities of the county; the other in a venereal disease clinic, where a study of the causative factors of promiscuity and of psychiatric and social methods of treatment is being undertaken. In connection with the latter study, a clinical psychologist will also be trained.

A private hospital, Mt. Zion Hospital of San Francisco, will receive funds to be used as supplementary stipends for the training of two psychiatrists in its out-patient clinic. The child guidance clinics in Orange County and in the San Francisco Children's Hospital will each receive funds to employ a psychiatric social worker. And the Los Angeles Psychiatric Service, a non-profit clinic for adults sponsored by the Community Chest, will receive funds to employ a half-time psychiatrist and to train two psychiatric social workers and two clinical psychologists.

The Department of Mental Hygiene will also receive funds from the State mental health authority to extend its out-patient services. Funds will be used, in addition to travel and operating expenses, to employ four psychiatrists, two clinical psychologists, three psychiatric social workers, and four clerks. These persons will be employed in the central office at Sacramento, the out-patient clinics of two State hospitals, the State home for mental defectives, and a new out-patient clinic in Berkeley. In addition, supplementary stipends will be given for the training of seven psychiatric residents at the Langley Porter Clinic in San Francisco.

California, then, is a State which has a number of mental health clinics not under the direct supervision of the State mental health authority, and which plans to use most of its funds for the support of these clinics. It also offers a good example of the type of cooperation that can exist among agencies in promoting better mental health for its citizens.

Montana has approached its mental health program in a third way. Until now, Montana has had no mental health services whatsoever outside of the State hospital. It plans to use Federal funds to inaugurate a traveling clinic, with headquarters at the Montana State Hospital, which will make bimonthly visits to 5 cities, in each of which a psychiatric social worker will be permanently situated. The traveling clinic staff will consist of three part-time psychiatrists, a psychiatric social work consultant, and a clerk. An out-patient department at the State hospital will also be established.

The Montana plan includes provision also for the training of a physician in psychiatry, a clinical psychologist, and a psychiatric social worker; for professional consultation services; for the establishment of a register of psychiatric patients; and for mental health education of lay and professional groups.

This plan represents a promising beginning for a State which has had no out-patient psychiatric clinics. The use of traveling clinics is one of the best means of bringing mental health services to as many people as possible, particularly in States with a widely dispersed population.

Each of the three programs is designed to meet the needs peculiar to the particular State. A State can benefit, of course, from the experience of others, but in the last analysis, it must survey its own needs and work out an aggressive program to meet these needs, both in terms of what can be done immediately with the resources at hand and what can and should be done on a long-term basis.

TRAINING AND RESEARCH

A report on the national mental health program would not be complete without informing you on the progress of its other facets—the research and training programs. At the time that $3,000,000 was appropriated for grants-in-aid to States, $1,500,000 was appropriated for training and research in the field of mental health. Approximately $1,100,000 of this sum was set aside for training grants and stipends and the remainder for research grants and fellowships.

Training.[5]—For the 1948 fiscal year, 59 grants were awarded to universities, hospitals, clinics and other teaching centers to improve and expand their training facilities, upon recommendation of the National Advisory Mental Health Council. Twenty-two of the grants were for training in psychiatry, 18 in clinical psychology, 10 in psychiatric social work, and 9 in psychiatric nursing.

In addition, 227 stipends were awarded, through institutions collaborating in the training program, to graduate students in the four mental health specialty fields: 82 in psychiatry, 41 in clinical psychology, 46 in psychiatric social work, and 58 in psychiatric nursing.

By expanding and improving existing training centers, stimulating potential ones, and encouraging qualified students to enter the field, it is hoped that the acute shortage of personnel will eventually be met.

Research.[5]—To date, 130 requests for research grants have been submitted. Thirty-nine were approved by the Council, of which it was possible to award 32. The approved projects range from investigations in biochemistry, neurophysiology, and neuropathology, through studies on epilepsy, schizophrenia, child psychiatry, and psychosomatic medicine, to methods of psychotherapy and mental hygiene techniques. Twenty-four fellowships have also been awarded to advanced students who have completed their professional training to conduct research in the field of mental health.

Since the last meeting of this group, Congress appropriated $850,000 for the purchase of a site and the drawing of plans and specifications for the National Institute of Mental Health, which will be consolidated with the new Institute of Health. Plans for its construction are well under way.

Intensive research into the causes, treatment, and prevention of mental illness, now made possible by the National Mental Health Act, offers new hope that answers to the problem of mental illness may yet be found.

CONCLUSION

As one takes stock of the accomplishments achieved by the States in the 5 months since funds became available to launch the national mental health program, one is deeply impressed by the ingenuity and resourcefulness of the States in developing mental health services, many in places heretofore barren of them, to meet the mental health needs of the people.

---

[5] Corrected to January 1, 1948.

But there is yet much to be done. Many of the activities made possible under the National Mental Health Act will not be realized for some time to come, but it is necessary to plan for the future as well as to deal with the realities of today. It is not possible to furnish mental health services in many instances because of personnel limitations. That is why a training program is necessary. It is not possible to prevent or adequately treat all types of mental illness with the knowledge we now possess. That is why a research program is necessary. It is not possible to use the knowledge we now possess unless funds are available to apply to it. That is why a State grant-in-aid program is necessary.

The desired goals cannot be reached at once. But real success can be obtained, as it has been in other public health programs. It will depend on the type of teamwork which has proved so effective in other fields of public health—on the cooperation and participation of States and communities, and of organizations and individuals interested in the mental health of the people.

STUDIES OF THE ACUTE DIARRHEAL DISEASES

XXI. Salmonellosis in Florida [1]

By MILDRED M. GALTON, *Bacteriologist*, and ALBERT V. HARDY,[2] *Director, Bureau of Laboratories, Florida State Board of Health*

Five years of observation on the occurrence of salmonellosis in Florida have been completed. In all there have been 746 isolations of 48 types, exclusive of *S. typhi*. The findings are summarized to aid in providing more adequate knowledge of the prevalence and distribution of these infections.

MATERIALS AND METHODS

Most of our information is the result of detailed bacteriological studies of specimens submitted routinely to a public health diagnostic laboratory. During the years 1942 through 1946 a total of 81,174 fecal specimens were examined by culture. At least 85 percent of these were submitted by food-handlers. The remainder were from individuals suspected of having enteric infections and from contacts examined in the course of infrequent epidemiological studies.

---

[1] From the Bureau of Laboratories, Florida State Board of Health.

[2] Formerly, Surgeon (R) Public Health Service.

The bacteriological methods have been modified as we sought to select highly effective procedures practicable for use in a diagnostic laboratory handling a large volume of work. The results obtained through the use of Kauffmann's combined enrichment method have been reported for the first 9 months during which it was used (*1*). In the Central Laboratory, during 1944, 1945, and 8 months of 1946, the relative efficacy of four procedures was compared. The results, given in table 1, emphasize the superiority of the enrichment methods. Of 451 *Salmonella* isolations, 252 (56 percent) were found only on cultures transferred from the tetrathionate brilliant-green broth enrichment. Furthermore, of the total isolations, the transfers from enrichment to the brilliant-green agar resulted in 392 positives, while transfers from the same broth to S. S. agar gave only 281 positives. The enrichment procedure yielded all but 12 of the total positives found. Direct streaking from the specimens in glycerine saline to S. S. agar was relatively ineffective for the isolation of *Salmonella*. Only 85 (19 percent) of the 451 positive specimens were found positive by this procedure, and in only two specimens was the isolation obtained from S. S. agar alone. The direct inoculation of the Wilson-Blair medium was more effective, but only 10 positives were found by this procedure which were not found by enrichment.

TABLE 1.—*The relative efficacy of varying cultural procedures for the isolation of* Salmonella *(exclusive of* S. typhi*) from fecal specimens submitted in glycerine-saline preservative, Florida, 1944, 1945 and 8 months of 1946*

Laboratory procedure	Total isolations	Isolations by one procedure only	Isolations by direct streak or enrichment only
Direct streak to S. S. agar	85	2	12
Direct streak to Wilson-Blair agar	170	10	
Enrichment [1] to S. S. agar	281	21	252
Enrichment [1] to brilliant-green agar	392	73	
Total	451	106	------------

[1] Tetrathionate brilliant-green bile broth.

The serological studies have been made with serums and cultures provided by Dr. P. R. Edwards and, later, with the "*Salmonella* typing kit" distributed by the Army Medical School. During the early months of this study, all cultures presumably *Salmonella* (exclusive of *S. typhi*) were sent to Dr. Edwards for final identification. Throughout the entire study he has guided and assisted generously. The accepted technics for identification of *Salmonella* by antigenic analysis have been used throughout.

SALMONELLA TYPES ISOLATED

Of the 81,174 fecal specimens submitted for culture during the 5-year period, 510 were positive for *S. typhi* and 746 were positive for other types of *Salmonella*. These latter included 48 types distributed in all groups except A as shown in table 2. The types found to occur most frequently in Florida were: *S. anatum* (14.4 percent of all), *S. derby* (9.6 percent), *S. oranienburg* (8.8 percent), *S. newport* (8.9 percent), and *S. typhi murium* (8.0 percent). Almost all (98.5 percent) of the *Salmonella* isolated exclusive of *S. typhi* were those considered to have animals as their natural host.

Seven types not previously isolated were found. These have been described by Edwards and his associates and given the names *S. florida* (*2*), *S. inverness* (*3*), *S. pensacola* (*4*), *S. miami* (*5*), *S. tallahassee*, *S. daytona* (*6*), and *S. luciana* (*7*). Three of these, *S. inverness*,

TABLE 2.—Salmonella *types isolated from fecal specimens in Florida, January 1942 through December 1946*

Group	Type	1942	1943	1944	1945	1946	Total
B	*S. bredeney*	--------	4	4	8	8	24
	S. derby	3	5	17	26	18	69
	S. saint paul	--------	--------	--------	3	2	5
	S. san diego	1	2	2	6	1	12
	S. paratyphi B	--------	1	2	4	3	10
	S. paratyphi B var. Java	--------	3	4	6	4	17
	S. typhi-murium	1	9	14	19	19	62
	S. typhi-murium var. Copenhagen	--------	2	--------	--------	--------	2
C	*S. bovis-morbificans*	--------	--------	--------	--------	1	1
	S. bareilly	--------	3	6	2	4	15
	S. bonariensis	2	--------	--------	--------	1	3
	S. cholerae suis var. Kunzendorf	--------	--------	1	1	--------	2
	S. hartford	2	2	--------	3	4	11
	S. litchfield	1	2	7	2	6	18
	S. manhattan	--------	--------	2	3	1	6
	S. montevideo	1	8	16	11	7	43
	S. newport	--------	10	25	20	12	67
	S. norwich	--------	--------	--------	1	--------	1
	S. oranienburg	1	11	14	13	27	66
	S. oregon	--------	4	3	1	2	10
	S. tennessee	--------	--------	1	8	5	14
	S. tallahassee	--------	--------	--------	5	1	6
	S. daytona	--------	--------	--------	1	--------	1
	S. gatuni	--------	--------	--------	--------	1	1
D	*S. berta*	--------	--------	3	3	--------	6
	S. javiana	--------	--------	1	2	--------	3
	S. panama	--------	--------	2	--------	1	3
	S. miami	2	4	38	4	5	53
	S. pensacola	--------	--------	1	--------	--------	1
E	*S. butanan*	--------	--------	--------	--------	1	1
	S. anatum	3	9	21	39	36	108
	S. give	--------	5	3	5	3	16
	S. meleagridis	--------	14	3	--------	3	20
	S. newington	--------	4	4	3	3	14
	S. senftenberg	--------	1	1	3	--------	5
	S. new-brunswick	--------	--------	--------	--------	2	2
Further groups.	*S. carrau*	--------	1	1	--------	--------	2
	S. cerro	--------	--------	1	2	--------	3
	S. coli	--------	1	--------	--------	--------	1
	S. florida	1	2	1	--------	--------	4
	S. gaminara	--------	1	--------	--------	--------	1
	S. hormaechei	--------	--------	--------	1	1	2
	S. inverness	--------	1	--------	--------	--------	1
	S. luciana	--------	--------	--------	1	2	3
	S. madelia	--------	2	--------	2	--------	4
	S. minnesota	1	--------	--------	7	2	10
	S. poona	1	--------	1	4	3	9
	S. rubislaw	--------	2	1	--------	1	4
	S. worthington	--------	--------	1	1	--------	2
	S. urbana	--------	--------	--------	--------	1	1
	Total	21	113	200	220	192	746
Fecal specimens examined		3,192	11,007	19,153	22,498	25,324	81,174

S. pensacola and *S. daytona*, were encountered once only. *S. pensacola* was isolated by a laboratory worker from himself during an acute attack of gastro-enteritis. The histories of the individuals who yielded *S. inverness* and *S. daytona* are unknown. *S. luciana* was isolated from three individuals, two apparently healthy food-handlers and one of unknown history. *S. florida* was isolated from four persons, one with acute diarrhea and three food-handlers. *S. tallahassee* was isolated from six persons, two with acute diarrhea, two apparently healthy food-handlers, and two of unknown history.

S. miami was the one new type which was found frequently. It was isolated 53 times, but 26 of these positives were obtained in one outbreak of gastro-enteritis involving 60 persons in Miami in May, 1944. This organism was isolated also from pickle served in a restaurant in which the affected individuals had eaten. The remaining isolations came from scattered localities. *S. miami* was at first thought to be serologically identical with the Japanese type, *S. sendai*, and was recorded as such in previous reports (*1*, *8*). A comparative study made by Edwards and Moran (*5*) of the cultural and serological characteristics of the Florida strains, the Japanese strains, and two cultures described by Borman and by Seligmann revealed that the Japanese strains and the American strains are culturally, biochemically, and serologically different, although they have the same antigenic formula.

EPIDEMIOLOGICAL COMMENT

There were no epidemiological field studies; the limited data were drawn from the laboratory request slips or collected by questionnaires.

The fecal specimens examined came largely from food-handlers. Most of the isolations were from apparently healthy individuals. Follow-up examinations were submitted on individuals found positive. The data suggest that the carrier state is relatively transient. Repeat positives were uncommon and the longest period over which one individual was found to harbor one type of *Salmonella* (other than *S. typhi*) was 4.5 months.

Multiple types were occasionally found from the same individual, as for example: A food-handler was first found to be harboring *Shigella paradysenteriae* (Flexner). On follow-up 2 weeks later, *Salmonella bredeney* was isolated. At the end of the 4th week *Shigella* (Flexner) was again found. Specimens from this patient were negative for the next 4½ months. At this time, *S. bredeney* was found a second time, followed in 6 weeks by the isolation of *S. anatum*. The history of this patient failed to reveal any indication of intestinal disturbance during the period in which she harbored these organisms or even at any previous time.

The data on clinical cases were too limited for comment, except to note that specimens sent to aid in the diagnosis of diarrheal disease were found positive for *Salmonella* frequently.

Geographically the various *Salmonella* types were scattered widely. The evidence did not suggest that there were foci of infection with the different types.

The explanation and significance of these widely distributed infections clearly warrants detailed investigation.

REFERENCES

(*1*) Galton, M. M., and Quan, M. S.: *Salmonella* isolated in Florida during 1943 with the combined enrichment method of Kauffmann. Am. J. Pub. Health **34:** 1071 (1944).

(*2*) Cherry, W. B., Edwards, P. R., and Bruner, D. W.: Two new *Salmonella* types with similiar somatic antigens. Proc. Soc. Exper. Biol. & Med., **52:** 125 (1943).

(*3*) Edwards, P. R., and Hughes, H.: A new *Salmonella* type with hitherto undescribed somatic antigens. Proc. Soc. Exper. Biol. & Med., **56:** 33 (1944).

(*4*) Moran, A. B., and Edwards, P. R.: A new *Salmonella* type: *S. pensacola.* Proc. Soc. Exper. Biol. & Med., **59:** 52 (1945)

(*5*) Edwards, P. R., and Moran, A. B.: *Salmonella* cultures which resemble the *Sendai* type. J. Bact., **50:** 257 (1945).

(*6*) Moran, A. B., and Edwards, P. R.: Three new *Salmonella* types: *S. richmond, S. daytona,* and *S. tallahassee.* Proc. Soc. Exper. Biol. & Med., **62:** 294 (1946).

(*7*) Moran, A. B., Edwards, P. R., and Bruner, D. W.: Two related *Salmonella* types: *S. luciana* and *S. marseille.* Proc. Soc. Exper. Biol. & Med., **64:** 89 (1947).

(*8*) Galton, M. M., and Quan, A. L.: Varieties of *Salmonella* isolated in Florida during 1942, Am. J. Hyg., **38:** 173 (1943).

DEATHS DURING WEEK ENDED MAY 29, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended May 29, 1948	Corresponding week, 1947
Data for 92 large cities of the United States:		
Total deaths	8,810	8,034
Median for 3 prior years	8,154	
Total deaths, first 22 weeks of year	212,689	212,259
Deaths under 1 year of age	670	674
Median for 3 prior years	609	
Deaths under 1 year of age, first 22 weeks of year	14,881	17,051
Data from industrial insurance companies:		
Policies in force	71,072,486	67,303,577
Number of death claims	12,697	9,374
Death claims per 1,000 policies in force, annual rate	9.3	7.3
Death claims per 1,000 policies, first 22 weeks of year, annual rate	10.1	9.9

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JUNE 5, 1948

Summary

The incidence of poliomyelitis increased during the week from 138 cases last week to 149 for the current week, as compared with 52 for the 5-year (1943–47) median, 42 for the corresponding week last year (the lowest corresponding figure of the past 5 years), and 144 (the highest) reported in 1946. For the current week, only 5 States reported more than 4 cases, as follows (last week's figures in parentheses): Texas 49 (60), California 28 (14), North Carolina 17 (14), Iowa 15 (4), and Florida 5 (5). During the 3-week period May 16 to June 5, only 6 States have reported more than 9 cases each, as follows (last year's corresponding figures in parentheses): Texas 148 (12), California 66 (43), North Carolina 44 (2), Iowa 24 (2), South Dakota 19 (0), Florida 15 (7). Since March 20, average date of seasonal low incidence, a total of 879 cases has been reported, as compared with 344 (the 5-year median) reported last year, 565 in 1946, the highest corresponding figure of the past 5 years, and 282, the lowest, in 1944.

Of 23 cases of Rocky Mountain spotted fever (last week 13, 5-year median 23), no State reported more than 3 cases. The total for the country to date is 88, as compared with a 5-year median of 82, reported for the same period last year.

One case of anthrax was reported for the week, in New Jersey. No occurrence of smallpox was reported.

Other diseases above the respective median expectancies, current and cumulative, are the dysenteries (amebic, bacillary, and undefined), tularemia, and undulant fever.

Deaths recorded during the week in 92 large cities in the United States totaled 8,510, as compared with 8,914 last week, 9,108 and 9,115, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 9,108. The cumulative figure is 222,985, as compared with 223,151 for the corresponding period last year. Infant deaths totaled 658, as compared with 667 last week and a 3-year median of 648. The total to date is 15,640, as compared with 17,851 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended June 5, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	June 5, 1948	May 31, 1947		June 5, 1948	May 31, 1947		June 5, 1948	May 31, 1947		June 5, 1948	May 31, 1947	
NEW ENGLAND												
Maine	5	2	2	1	3	1	61	101	101	1	1	1
New Hampshire	0	0	0	-------	2	-------	13	1	50	0	0	1
Vermont	0	0	0	-------	-------	-------	21	94	94	5	0	0
Massachusetts	11	12	4	-------	-------	-------	1,429	343	810	1	0	5
Rhode Island	1	1	0	-------	-------	-------	17	112	96	0	0	1
Connecticut	1	0	1	-------	-------	-------	98	823	345	1	1	3
MIDDLE ATLANTIC												
New York	9	14	14	[1] 1	[1] 5	[1] 4	2,226	599	922	6	2	10
New Jersey	2	2	2	1	1	1	2,527	675	724	5	2	6
Pennsylvania	9	8	9	(2)	(2)	(2)	2,340	180	621	2	3	14
EAST NORTH CENTRAL												
Ohio	2	8	7	2	7	6	558	919	644	0	1	7
Indiana	7	4	7	1	1	1	1,051	75	162	2	2	2
Illinois	6	5	5	-------	-------	2	590	175	396	4	2	16
Michigan [3]	0	0	6	-------	-------	1	1,186	157	503	1	1	9
Wisconsin	0	0	1	11	4	22	1,566	893	1,582	1	2	2
WEST NORTH CENTRAL												
Minnesota	2	2	2	-------	1	-------	119	601	275	0	0	0
Iowa	6	2	3	-------	-------	-------	138	181	109	1	0	1
Missouri	1	1	2	3	1	1	104	96	124	2	1	7
North Dakota	0	1	0	-------	-------	-------	139	144	11	0	0	0
South Dakota	1	0	0	-------	-------	-------	41	132	28	1	0	0
Nebraska	0	1	1	3	2	2	149	30	134	1	0	1
Kansas	3	5	5	-------	-------	-------	35	9	117	0	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	-------	-------	-------	9	-------	4	0	0	1
Maryland [3]	5	3	6	3	6	-------	869	47	186	2	1	2
District of Columbia	0	0	0	-------	-------	-------	129	10	88	2	1	1
Virginia	11	5	5	156	138	88	462	217	364	1	2	7
West Virginia	4	5	3	6	27	2	89	13	42	1	0	2
North Carolina	2	4	9	-------	-------	-------	19	110	235	0	1	2
South Carolina	1	7	2	170	356	145	187	173	173	0	0	0
Georgia	4	1	2	5	1	5	49	35	58	0	4	1
Florida	2	2	2	-------	3	-------	215	48	124	0	0	4
EAST SOUTH CENTRAL												
Kentucky	9	3	2	-------	1	1	274	6	88	2	0	5
Tennessee	2	7	2	12	7	15	131	35	102	1	2	4
Alabama	1	9	2	10	46	33	20	213	145	1	5	5
Mississippi [3]	1	7	5	1	4	-------	6	15	-------	1	2	1
WEST SOUTH CENTRAL												
Arkansas	2	4	2	27	10	9	62	46	46	0	0	1
Louisiana	5	5	3	2	2	2	5	27	31	1	0	3
Oklahoma	3	2	2	27	34	28	70	2	29	1	1	2
Texas	17	14	25	329	329	329	1,488	314	345	5	5	12
MOUNTAIN												
Montana	1	0	0	-------	2	4	38	50	70	0	0	0
Idaho	0	0	0	2	6	-------	47	32	29	0	0	0
Wyoming	0	0	0	-------	2	-------	45	5	36	0	0	0
Colorado	4	4	6	4	13	14	501	49	148	0	2	1
New Mexico	0	0	1	-------	5	3	46	65	44	0	1	0
Arizona	2	1	1	31	49	44	257	74	48	0	0	0
Utah [3]	5	0	0	-------	-------	2	549	4	94	0	0	0
Nevada	0	0	0	-------	-------	-------	-------	-------	13	0	0	0
PACIFIC												
Washington	1	3	4	-------	1	1	606	14	137	2	1	2
Oregon	0	0	0	5	8	7	415	8	104	0	1	1
California	10	11	17	11	20	20	2,887	207	1,308	4	7	11
Total	158	165	174	824	1,097	1,026	23,883	7,959	16,130	58	55	173
22 weeks	4,074	5,557	5,557	133,962	296,940	185,879	443,446	142,413	444,654	1,707	1,882	4,877
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	10,432	13,123	14,347	177,520	329,915	329,915	478,392	165,300	482,667	2,489	2,854	7,329

---

[1] New York City only. [2] Philadelphia only.

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended June 5, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever[4]		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	June 5, 1948	May 31, 1947		June 5, 1948	May 31, 1947		June 5, 1948[6]	May 31, 1947		June 5, 1948	May 31, 1947	
NEW ENGLAND												
Maine	0	0	0	10	13	27	0	0	0	0	0	0
New Hampshire	0	0	0	0	1	6	0	0	0	0	0	0
Vermont	0	0	0	2	10	10	0	0	0	0	0	0
Massachusetts	0	0	0	229	94	221	0	0	0	[6] 4	1	1
Rhode Island	0	0	0	5	12	12	0	0	0	0	0	0
Connecticut	0	0	0	19	22	56	0	0	0	1	0	0
MIDDLE ATLANTIC												
New York	2	1	3	[5] 180	176	389	0	0	0	[6] 2	3	3
New Jersey	4	1	1	42	76	98	0	0	0	0	1	1
Pennsylvania	0	0	1	222	209	230	0	0	0	3	11	3
EAST NORTH CENTRAL												
Ohio	3	2	1	212	196	296	0	0	0	1	2	2
Indiana	2	0	0	36	41	55	0	0	0	1	0	2
Illinois	0	2	2	98	53	155	0	0	1	1	5	2
Michigan[3]	1	1	1	74	116	139	0	0	0	0	2	2
Wisconsin	0	0	0	42	54	253	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	0	1	1	17	46	53	0	0	0	0	1	1
Iowa	15	1	0	17	4	34	0	0	0	1	1	1
Missouri	3	0	0	[5] 8	27	47	0	0	1	1	1	4
North Dakota	0	0	0	4	0	5	0	0	0	3	0	0
South Dakota	0	0	0	2	2	12	0	0	0	0	0	0
Nebraska	4	0	0	18	11	22	0	0	0	0	0	0
Kansas	1	0	0	12	35	35	0	0	1	1	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	3	3	2	0	0	0	0	0	0
Maryland[3]	0	0	0	[5] 16	25	73	0	0	0	1	1	1
District of Columbia	0	0	0	7	4	8	0	0	0	1	0	0
Virginia	0	0	0	19	12	36	0	0	0	2	1	1
West Virginia	0	0	0	[5] 9	9	17	0	0	0	0	0	0
North Carolina	17	1	2	10	11	24	0	0	0	3	2	2
South Carolina	0	0	1	3	2	6	0	0	0	[6] 2	2	2
Georgia	1	1	1	14	6	10	0	0	0	[6] 2	2	5
Florida	5	2	3	4	3	3	0	0	0	[6] 2	0	2
EAST SOUTH CENTRAL												
Kentucky	0	4	1	17	14	24	0	0	0	0	4	1
Tennessee	0	0	0	11	16	13	0	0	0	0	1	2
Alabama	1	0	2	5	8	8	0	3	0	0	0	1
Mississippi[3]	0	0	1	0	4	3	0	0	0	2	1	2
WEST SOUTH CENTRAL												
Arkansas	2	0	0	5	2	5	0	0	0	4	4	4
Louisiana	4	0	0	2	6	7	0	0	0	5	3	5
Oklahoma	2	1	1	6	1	10	0	0	0	2	1	0
Texas	49	5	6	19	11	45	0	0	0	[6] 9	4	8
MOUNTAIN												
Montana	0	0	0	4	9	9	0	0	0	0	0	0
Idaho	2	0	0	0	7	16	0	0	0	0	0	0
Wyoming	0	0	0	2	2	6	0	0	0	0	0	0
Colorado	2	0	0	12	19	36	0	0	0	1	0	1
New Mexico	0	0	0	3	8	4	0	0	0	0	3	0
Arizona	0	1	0	0	4	9	0	0	0	1	0	0
Utah[3]	0	0	1	8	5	13	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	1	0	0	17	23	23	0	0	1	0	0	1
Oregon	0	0	0	15	9	22	0	0	0	1	0	0
California	28	18	11	67	92	147	0	0	0	[6] 2	4	4
Total	149	42	52	1, 527	1, 513	2, 844	0	3	7	59	61	80
22 weeks	1, 227	956	811	48, 238	54, 185	85, 342	45	134	234	1, 139	1, 085	1, 316
Seasonal low week[4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	879	344	344	70, 777	80, 871	123, 663	66	188	310	666	600	705

---

[3] Period ended earlier than Saturday.

[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

[5] Including cases reported as streptococcal infections and septic sore throat.

[6] Including paratyphoid fever and salmonella infections reported separately, as follows: Massachusetts (salmonella infection) 4, New York (salmonella infection) 2, South Carolina 1, Georgia 1, Florida 1, Texas 1, California 1.

Telegraphic morbidity reports from State health officers for the week ended June 5, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended June 5, 1948							
	Week ended—		Median 1943–47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	June 5, 1948	May 31, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	8	19	19	------	9	------	------	------	------	------	------
New Hampshire	3	4	4	------	------	------	------	------	------	------	------
Vermont	23	1	13	------	------	------	------	------	------	------	1
Massachusetts	23	100	100	------	8	------	1	------	------	------	1
Rhode Island	8	19	19	------	------	------	------	------	------	------	------
Connecticut	6	44	35	------	------	------	------	------	------	------	1
MIDDLE ATLANTIC											
New York	75	131	131	12	1	------	------	------	------	------	6
New Jersey	43	149	88	3	------	------	------	1	------	------	1
Pennsylvania	45	146	146	------	------	------	------	------	------	------	3
EAST NORTH CENTRAL											
Ohio	28	192	110	------	------	------	------	1	------	------	15
Indiana	11	24	30	------	------	------	3	------	------	------	3
Illinois	22	70	76	5	3	------	2	1	1	------	8
Michigan [3]	42	217	125	2	------	------	1	------	------	------	4
Wisconsin	36	149	127	------	------	------	------	------	------	------	4
WEST NORTH CENTRAL											
Minnesota	8	36	22	------	------	------	------	------	------	------	------
Iowa	9	17	17	------	------	------	------	------	------	------	------
Missouri	6	39	26	------	------	------	------	------	4	------	1
North Dakota	2	101	2	------	------	------	------	------	------	------	------
South Dakota	2	1	3	------	------	------	------	------	------	------	------
Nebraska	12	6	7	7	------	------	------	------	------	------	2
Kansas	38	31	32	------	------	------	------	------	------	------	3
SOUTH ATLANTIC											
Delaware	3	5	------	------	------	------	------	2	------	------	------
Maryland [3]	5	92	83	------	------	3	------	2	------	------	------
District of Columbia	------	22	11	------	------	------	------	------	------	------	------
Virginia	58	85	85	------	------	58	------	3	2	------	1
West Virginia	10	17	29	------	------	------	------	2	------	------	------
North Carolina	65	77	116	------	------	------	(7)	1	1	------	------
South Carolina	89	204	71	------	6	------	------	------	------	1	1
Georgia	4	29	29	------	1	------	------	------	1	7	9
Florida	21	74	26	10	------	1	------	------	1	5	6
EAST SOUTH CENTRAL											
Kentucky	25	35	34	------	------	------	------	1	1	------	1
Tennessee	19	42	42	9	------	------	1	2	------	------	2
Alabama	36	148	37	------	------	------	------	------	------	1	1
Mississippi [3]	5	16	------	------	------	------	------	------	------	1	1
WEST SOUTH CENTRAL											
Arkansas	30	63	13	7	------	14	------	------	6	------	------
Louisiana	7	10	2	2	------	------	------	------	------	------	1
Oklahoma	30	41	15	2	------	------	------	------	2	------	------
Texas	353	782	330	33	452	120	------	------	6	10	12
MOUNTAIN											
Montana	3	7	5	------	------	------	------	------	------	------	------
Idaho	7	3	8	------	------	------	------	------	------	------	------
Wyoming	12	1	3	------	------	------	------	2	------	------	------
Colorado	30	4	24	------	4	------	------	1	------	------	7
New Mexico	9	24	8	------	------	------	------	------	------	------	------
Arizona	18	53	23	------	------	46	------	------	------	------	------
Utah [3]	4	6	21	------	------	------	------	1	------	------	3
Nevada	------	------	------	------	------	------	------	------	------	------	------
PACIFIC											
Washington	9	14	16	3	------	------	------	------	------	------	2
Oregon	18	11	17	1	------	1	------	3	------	------	------
California	73	240	240	6	6	------	1	------	------	1	5
Total	1,393	3,601	2,366	102	490	243	9	23	25	26	105
Same week: 1947	3,601	------	------	50	316	147	4	19	37	30	90
Median, 1943–47	2,366	------	------	50	483	114	14	23	20	52	[8] 91
22 weeks: 1948	44,864	------	------	1,667	7,065	4,199	[7] 194	88	413	325	2,025
1947	63,311	------	------	1,066	6,528	4,242	144	82	681	804	2,293
Median, 1943–47	54,758	------	------	681	6,528	2,503	193	82	387	1,015	[8] 1,967

---

[3] Period ended earlier than Saturday.

[7] Correction (deducted from cumulative total): Encephalitis, North Carolina, week ended May 15, 0, (instead of 1 case).

[8] 3-year median 1945–47.

Anthrax: New Jersey, 1 case.
Alaska: Chickenpox 4, mumps 1, whooping cough 4, pneumonia 1.
Territory of Hawaii: Rabies 0, bacillary dysentery 1, measles 1, scarlet fever 4, whooping cough 12.

WEEKLY REPORTS FROM CITIES*

City reports for week ended May 29, 1948

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	3	0	1	0	1	0	0	------
New Hampshire:												
Concord	0	0	------	0	3	0	3	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	-------	0	0	0	0	0	0	------
Massachusetts:												
Boston	4	0	------	0	297	0	9	0	108	0	0	3
Fall River	0	0	------	0	30	0	0	0	4	0	0	------
Springfield	0	0	------	0	9	0	0	0	1	0	0	------
Worcester	0	0	------	0	64	0	8	0	7	0	0	5
Rhode Island:												
Providence	0	0	------	0	12	0	1	0	2	0	0	9
Connecticut:												
Bridgeport	0	0	------	0	-------	0	0	0	1	0	0	------
Hartford	0	0	------	0	5	0	6	0	2	0	0	1
New Haven	0	0	------	0	11	1	0	0	4	0	0	6
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	58	0	9	0	11	0	0	1
New York	8	3	4	0	1, 118	7	50	1	63	0	0	19
Rochester	0	0	------	0	1	0	2	0	10	0	0	1
Syracuse	0	0	------	0	20	0	1	0	4	0	0	7
New Jersey:												
Camden	0	0	------	0	42	0	0	0	3	0	0	------
Newark	0	0	------	0	510	1	1	0	5	0	0	6
Trenton	0	0	------	0	11	0	1	0	1	0	1	------
Pennsylvania:												
Philadelphia	3	0	1	0	945	0	12	0	55	0	3	7
Pittsburgh	0	0	------	1	14	1	5	0	46	0	0	5
Reading	0	0	------	0	11	0	0	0	13	0	0	7
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	119	2	5	0	11	0	0	2
Cleveland	0	0	------	0	30	3	6	0	47	0	0	5
Columbus	0	0	------	0	19	0	0	1	2	0	0	------
Indiana:												
Fort Wayne	0	0	------	0	5	0	0	0	9	0	0	------
Indianapolis	0	0	------	0	163	0	4	0	5	0	0	1
South Bend	0	0	------	0	4	0	0	0	1	0	0	------
Terre Haute	0	0	------	0	-------	0	0	0	0	0	0	------
Illinois:												
Chicago	0	0	------	0	247	2	24	0	36	0	0	15
Springfield	0	0	------	0	-------	0	3	0	3	0	0	------
Michigan:												
Detroit	0	4	------	0	715	1	9	0	67	0	0	12
Flint	0	0	------	0	9	0	0	0	2	0	0	------
Grand Rapids	0	0	------	0	15	0	0	0	12	0	0	2
Wisconsin:												
Kenosha	0	0	------	0	57	0	0	0	0	0	0	------
Milwaukee	0	0	------	0	233	0	3	0	14	0	0	3
Racine	0	0	------	0	26	0	0	0	1	0	0	5
Superior	0	0	------	0	80	0	0	0	0	0	0	------
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	90	0	0	0	0	0	0	------
Minneapolis	0	0	------	0	11	0	1	0	4	0	0	4
St. Paul	0	0	------	0	50	0	4	0	1	0	0	6
Missouri:												
Kansas City	0	0	3	0	17	0	4	0	1	0	0	2
St. Joseph	0	0	------	0	8	0	0	0	0	0	0	------
St. Louis	9	0	------	0	41	1	7	0	7	0	0	12

*In some instances the figures include nonresident cases.

City reports for week ended May 29, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	0	37	1	1	0	4	0	0	------
Kansas:												
Wichita	0	0	------	0	3	0	3	0	1	0	0	3
SOUTH ATLANTIC												
Delaware:												
Wilmington	1	0	------	1	16	0	4	0	1	0	0	------
Maryland:												
Baltimore	1	0	------	0	622	1	7	0	8	0	0	2
Cumberland	3	0	------	0	------	0	0	0	6	0	0	------
Frederick	0	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	138	0	7	0	0	0	0	3
Virginia:												
Lynchburg	0	0	------	0	2	0	0	0	0	0	0	1
Richmond	0	0	------	0	3	1	1	1	1	0	0	------
Roanoke	0	0	------	0	1	0	0	0	0	0	0	------
West Virginia:												
Charleston	0	0	------	0	34	0	0	0	0	0	0	------
Wheeling	1	0	------	0	5	0	0	0	0	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	0	0	0	0	0	0	1
Wilmington	0	0	------	0	------	0	0	0	0	0	0	------
Winston-Salem	0	0	------	0	7	0	3	0	0	0	0	2
South Carolina:												
Charleston	1	0	5	0	1	1	0	0	1	0	0	5
Georgia:												
Atlanta	0	0	------	0	6	0	3	1	7	0	1	------
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Savannah	0	0	------	0	------	0	0	0	2	0	0	2
Florida:												
Tampa	0	0	------	0	4	0	0	1	0	0	0	3
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	1	------	1	25	0	7	0	0	0	2	10
Nashville	0	0	------	0	5	0	2	0	1	0	0	2
Alabama:												
Birmingham	0	0	------	0	5	0	2	0	0	0	0	4
Mobile	0	0	------	0	------	0	0	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	6	0	5	0	1	0	0	1
Louisiana:												
New Orleans	0	0	2	1	3	1	6	3	1	0	2	4
Shreveport	0	0	------	0	0	0	8	0	0	0	0	------
Oklahoma:												
Oklahoma City	0	0	------	0	11	0	3	0	0	0	1	------
Texas:												
Dallas	1	0	1	1	68	0	1	0	3	0	0	------
Galveston	0	0	------	0	4	0	3	0	0	0	0	1
Houston	1	0	------	0	------	0	3	11	1	0	0	------
San Antonio	0	0	------	0	5	0	5	0	1	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	------	0	1	0	0	0	0	------
Great Falls	0	0	------	0	------	0	1	0	0	0	0	1
Helena	0	0	------	0	------	0	0	0	0	0	0	------
Missoula	0	0	------	0	------	0	0	0	0	0	0	2
Colorado:												
Denver	1	0	2	0	76	0	6	0	6	0	0	8
Pueblo	1	0	------	0	116	0	1	0	2	0	0	------
Utah:												
Salt Lake City	0	0	------	0	187	0	0	1	0	0	0	2

City reports for week ended May 29, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	-------	1	5	0	8	0	0	3
Spokane	0	0	------	0	16	0	2	0	2	0	0	------
California:												
Los Angeles	1	0	3	2	392	0	6	4	20	0	0	3
Sacramento	0	0	------	0	16	0	1	0	1	0	0	3
San Francisco	3	1	------	0	150	0	3	0	7	0	0	6
Total	39	9	21	7	7,067	25	279	24	649	0	10	218
Corresponding week, 1947 [1]	48	------	40	8	2,604	------	256	------	627	0	15	960
Average 1943-47 [1]	59	------	37	[2] 11	[3] 4,169	------	[2] 275	------	1,137	0	14	698

[1] Exclusive of Oklahoma City.
[2] 3-year average, 1945–47.
[3] 5-year median, 1943–47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (latest available estimated population, 34,388,400)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Tyhpoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	10.5	0.0	0.0	0.0	1,134	2.6	73.2	0.0	340	0.0	0.0	63
Middle Atlantic	5.1	1.4	2.3	0.5	1,264	4.2	37.5	0.5	98	0.0	1.9	25
East North Central	0.0	2.4	0.0	0.0	1,047	4.9	32.8	0.6	128	0.0	0.0	27
West North Central	18.5	0.0	6.2	0.0	530	4.1	41.2	0.0	37	0.0	0.0	56
South Atlantic	11.4	0.0	8.2	1.6	1,371	4.9	40.9	4.9	42	0.0	1.6	31
East South Central	0.0	5.9	0.0	5.9	207	0.0	64.9	0.0	6	0.0	11.8	94
West South Central	5.1	0.0	7.6	5.1	246	2.5	86.4	35.6	18	0.0	7.6	15
Mountain	16.5	0.0	16.5	0.0	3,131	0.0	74.3	8.3	66	0.0	0.0	107
Pacific	6.6	1.6	4.9	3.3	944	1.6	28.0	6.6	62	0.0	0.0	25
Total	5.9	1.4	3.2	1.1	1,075	3.8	42.4	3.6	99	0.0	1.5	331

Dysentery, amebic.—Cases: New York 14; Detroit 11; Memphis 9; New Orleans 7; Los Angeles 1.
Dysentery, bacillary.—Cases: Worcester 2; New York 3; Philadelphia 1; Chicago 4; Los Angeles 2.
Dysentery unspecified.—Cases: San Antonio 134.
Typhus fever.—Cases: New Orleans 2.

PLAGUE INFECTION IN CATRON AND RIO ARRIBA COUNTIES, NEW MEXICO

Under date of June 3, plague infection was reported proved in tissue and pools of fleas from rodents taken in Catron and Rio Arriba Counties, New Mexico, as follows:

Catron County.—A pool of 29 fleas from 8 spotted ground squirrels, *Citellus spilosoma major*, taken May 14 on State Highway No. 12, 10 miles southwest of Datil.

Rio Arriba County.—In tissue and pools of fleas from prairie dogs, *Cynomys gunnisoni gunnisoni*, as follows: A pool of 35 fleas from 14 prairie dogs taken May 17, 10 miles west of Chama on a ranch near U. S. Highway No. 84; in tissue and a pool of 34 fleas from 1 prairie dog taken May 24, on a ranch 13 miles west of Parkview on State Highway No. 95; in tissue and a pool of 21 fleas from 1 prairie dog found dead on a ranch 9 miles west of Parkview on State Highway No. 95; in tissue and a pool of 5 fleas from 1 sick prairie dog also taken at the last named location.

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—April 1948.—During the month of April 1948, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Residence [1]									
	Panama City		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	5				5		7		17	
Diphtheria	2		2	1	1				5	1
Dysentery:										
Amebic	1						3		4	
Bacillary					2		1		3	
German measles							2		2	
Hepatitis, infectious	1				6		1		8	
Malaria [2]	2		1		7		89	1	99	1
Measles	7				3		11		21	
Mumps							1		1	
Pneumonia		5		4	15			3	[3] 15	12
Poliomyelitis					1				1	
Tuberculosis		19		6	2			3	[3] 2	28
Typhoid fever	1								1	
Yaws					1				1	

---

[1] If place of infection is known, cases are so listed instead of by residence.

[2] 4 recurrent cases.

[3] In the Canal Zone only.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended May 15, 1948.—During the week ended May 15, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		71	1	239	396	77	20	20	154	978
Diphtheria				9	5		1			15
Dysentery, bacillary					1					1
German measles				101	10		2	10	18	141
Influenza		13			10	13			1	37
Measles		6	1	546	1,045	18	5	65	212	1,898
Meningitis, meningococcus			1		2					3
Mumps		3	1	332	228	56	70	54	11	755
Poliomyelitis					2					2
Scarlet fever			3	61	75	7		3	6	155
Tuberculosis (all forms)		3	11	114	45	40	5	2	70	290
Typhoid and paratyphoid fever				13	1		1			15
Undulant fever					1			2	2	5
Venereal diseases:										
Gonorrhea		7	8	159	78	39	20	26	62	399
Syphilis		5	5	59	48	5	8	5	9	144
Whooping cough		15		51	13	1	6	47	2	135

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From consular reports, international health organizations, medical officers of the Public Health Service, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

(Cases)

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place	January-March 1948	April 1948	May 1948—week ended—				
			1	8	15	22	29
AFRICA							
Egypt	1						
Cairo	1						
ASIA							
Burma	2		2			3	
Rangoon			2				
India	25,400	12,201	4,000	3,264	1,707		
Ahmadabad	2						
Alleppey	1						
Calcutta [1]	2,180	1,352	401	435	433	310	
Cawnpore	14	8	1				
Cocanada	2						
Colachel	12						
Cuddalore	12						

See footnotes at end of table.

CHOLERA—Continued

Place	January-March 1948	April 1948	May 1948—week ended—				
			1	8	15	22	29
ASIA—continued							
India—continued							
Kilakarai	21	--------	--------	--------	--------	--------	--------
Lucknow	9	3	3	1	2	--------	--------
Madras	18	11	1	1	3	6	--------
Nagpur	1	3	--------	--------	--------	--------	--------
Negapatam	16	--------	--------	--------	--------	--------	--------
New Delhi	--------	1	1	--------	--------	--------	--------
Tuticorin	16	--------	--------	--------	--------	--------	--------
Vizagapatam	1	--------	--------	--------	--------	--------	--------
India (French):							
Chandernagor	17	4	--------	--------	--------	--------	--------
Karikal	300	--------	--------	--------	--------	--------	--------
Pondicherry	59	--------	--------	--------	--------	--------	--------
Indochina (French):							
Cambodia	803	169	--------	--------	[2] 48	[3] 18	--------
Cochinchina	171	273	12	--------	[2] 48	[3] 29	--------
Chaudoc	2	--------	--------	--------	--------	--------	--------
Cholon	5	16	--------	8	--------	--------	--------
Giadinh	4	16	--------	3	--------	--------	--------
Longxuyen	7	--------	--------	--------	--------	--------	--------
Mytho	12	22	--------	9	--------	--------	--------
Rachgia	97	27	--------	2	--------	--------	--------
Saigon	23	57	12	13	11	5	--------
Laos	[4] 12	--------	--------	--------	--------	--------	--------
Tonkin	1	--------	--------	--------	--------	--------	--------
Pakistan	8, 240	7, 139	1, 349	1, 941	29	16	--------
Chittagong	28	2	[5] 1	--------	--------	2	--------
Karachi	--------	--------	--------	--------	--------	2	--------
Lahore	2	27	24	20	29	14	--------
Siam	31	5	1	--------	1	--------	--------
Syria	3	--------	--------	--------	--------	--------	--------

[1] Includes imported cases.
[2] For the period May 1-10, 1948.
[3] For the period May 11-20, 1948.
[4] Deaths.
[5] Imported.

PLAGUE

(Cases)

AFRICA							
Belgian Congo	2	1	--------	--------	6	--------	--------
British East Africa:							
Kenya	15	1	--------	--------	--------	--------	--------
Tanganyika	190	(1)	(1)	(1)	(1)	(1)	(1)
Madagascar	152	36	--------	--------	[2] 5	--------	--------
Tananarive	10	6	--------	--------	--------	--------	--------
Rhodesia, Northern	25	1	--------	--------	--------	--------	--------
Union of South Africa	[3] 35	2	--------	--------	--------	--------	--------
ASIA							
Burma	[4] 402	50	6	3	--------	--------	--------
Mandalay	13	3	1	--------	--------	--------	--------
Rangoon	[5] 11	[6] 1	--------	1	1	--------	--------
China:							
Chekiang Province	3	3	--------	--------	--------	--------	--------
Wenchow	2	3	--------	--------	--------	--------	--------
Fukien Province	49	8	--------	--------	[2] 1	--------	--------
Kiangsi Province	16	--------	--------	--------	--------	--------	--------
Kwangtung Province	29	15	--------	--------	--------	--------	--------
Yunnan Province	31	--------	--------	--------	--------	--------	--------
India	15, 335	3, 761	372	117	54	--------	--------
Indochina (French):							
Annam	131	3	--------	--------	[2] 1	--------	--------
Cochinchina	23	17	--------	--------	--------	--------	--------
Laos	2	--------	--------	--------	--------	--------	--------
Java	4	--------	--------	--------	--------	--------	--------
Pakistan	--------	--------	11	--------	--------	--------	--------
Siam	99	3	--------	--------	--------	--------	--------
EUROPE							
Portugal: Azores	7	1	--------	--------	--------	--------	--------

See footnotes at end of table.

PLAGUE—Continued

Place	January-March 1948	April 1948	May 1948—week ended—				
			1	8	15	22	29
SOUTH AMERICA							
Argentina:							
Buenos Aires Province	5	-------	-------	-------	-------	-------	-------
Ecuador	19	3	-------	-------	-------	-------	-------
Chimborazo Province	1	-------	-------	-------	-------	-------	-------
Loja Province	1	3	-------	-------	-------	-------	-------
Peru:							
Huacho Department	1	-------	-------	-------	-------	-------	-------
Lima Department	4	-------	-------	-------	-------	-------	-------
Venezuela:							
Aragua State	-------	-------	7	-------	-------	-------	-------
OCEANIA							
Hawaii Territory: Plague-infected rats [7]	5	-------	-------	-------	-------	-------	-------

---

[1] For the period Apr. 1–May 25, 1948, 73 cases of plague (not distributed by weeks) were reported in Tanganyika.

[2] For the period May 1–10, 1948.

[3] Includes 4 cases of pneumonic plague.

[4] Includes imported cases.

[5] Includes 4 imported cases.

[6] Imported.

[7] Plague infection was also reported in Hawaii Territory, under date of Feb. 27, 1948, in a mass inoculation of tissue from 19 rats.

SMALLPOX

(Cases)

(P=present)

AFRICA							
Algeria	112	40	-------	-------	[1] 13	-------	-------
Angola	54	2	-------	-------	-------	-------	-------
Basutoland	3	-------	-------	-------	-------	-------	-------
Belgian Congo	[2] 627	[2] 293	[2] 67	-------	-------	-------	-------
British East Africa:							
Kenya	65	20	-------	1	-------	-------	-------
Nyasaland	1,208	319	142	19	-------	-------	-------
Tanganyika	454	95	-------	12	-------	-------	-------
Uganda	116	44	12	-------	-------	-------	-------
Cameroon (French)	2	1	-------	-------	-------	-------	-------
Dahomey	182	15	-------	-------	[1] 2	[3] 20	-------
Egypt	207	125	4	13	17	-------	-------
Eritrea	5	4	-------	-------	-------	-------	-------
French Equatorial Africa	10	-------	-------	-------	-------	-------	-------
French Guinea	68	47	-------	-------	[1] 6	-------	-------
French West Africa: Haute-Volta	282	93	-------	-------	[1] 15	[3] 7	-------
Gambia	19	5	-------	1	-------	-------	-------
Gold Coast	437	230	38	21	10	-------	-------
Ivory Coast	199	115	-------	-------	[1] 105	[3] 64	-------
Libya	77	152	6	-------	3	14	-------
Mauritania	1	-------	-------	-------	-------	-------	-------
Morocco (French)	13	3	-------	-------	-------	[3] 4	-------
Mozambique	22	2	-------	-------	-------	-------	-------
Nigeria	316	-------	-------	-------	-------	-------	-------
Niger Territory	220	25	-------	-------	[1] 9	-------	-------
Rhodesia:							
Northern	[4] 103	(5)	-------	-------	-------	2	-------
Southern	190	-------	-------	-------	-------	-------	-------
Senegal	3	-------	-------	-------	-------	-------	-------
Sierra Leone	83	42	-------	-------	-------	-------	-------
Sudan (Anglo-Egyptian)	[2] 359	[2] 77	50	65	164	-------	-------
Sudan (French)	14	2	-------	-------	-------	-------	-------
Swaziland	-------	1	-------	-------	-------	-------	-------
Togo (British)	9	-------	-------	-------	-------	-------	-------
Togo (French)	33	34	-------	-------	[1] 1	-------	-------
Tunisia	465	32	-------	-------	-------	-------	-------
Union of South Africa	16	P	-------	P	-------	-------	-------
ASIA							
Arabia	[6] 2	3	2	-------	-------	-------	-------
British North Borneo	1	-------	-------	-------	-------	-------	-------
Burma	1,310	579	135	100	14	52	-------
Ceylon	[7] 7	-------	-------	[6] 1	-------	-------	-------
China	2,235	530	92	52	73	72	-------

See footnotes at end of table.

SMALLPOX—Continued

Place	January-March 1948	April 1948	May 1948—week ended— 1	8	15	22	29
ASIA—continued							
India	24, 745	11, 490	2, 731	2, 251	[8] 85	[8] 68	
India (French)	5		1				
Indochina (French)	1, 572	222			[1] 196	[3] 165	
Iran	356	43	12	1			
Iraq	350	212	19	22	14	17	
Japan	8	6	1				
Lebanon	57						
Malay States (Federated)	318	26					
Manchuria	30						
Pakistan	7, 420	940	[8] 37	[8] 11	[8] 12	[8] 17	
Palestine	8						
Siam	391	43	2	15			
Straits Settlements		3	3	1	1	1	
Syria	29	3		2	1		
Trans-Jordan	6	7					
EUROPE							
France	3						
Germany	3						
Portugal	51	8					
Spain	17	1					
Canary Islands	9						
NORTH AMERICA							
Guatemala	1						
Mexico	190	26		[9] 9			
SOUTH AMERICA							
Argentina	7						
Bolivia	31						
Brazil	10	1			5		
Chile	3	1		1			
Colombia	1, 897	[10] 119	[10] 18	[10] 15	[10] 18		
Ecuador	[2] 1, 458	[2] 264			[11] 5		
Paraguay	[12] 52	[12] 11					
Peru	55	22					
Trinidad					[13] 8		
Venezuela	[12] 1, 244	[12] 239	[12] 25		[12][13] 63	[12] 119	

---

[1] For the period May 1-10, 1948. [2] Includes alastrim. [3] For the period May 11-20, 1948. [4] For January-February 1948. [5] During the period Mar. 1-Apr. 30, 1948, 74 deaths from smallpox were reported in Northern Rhodesia. [6] Imported. [7] Includes 6 imported cases. [8] From ports only. [9] For the period Apr. 25-May 8, 1948. [10] For Cartagena only. [11] For Quito only. [12] Alastrim. [13] For the period May 1-15, 1948.

TYPHUS FEVER*

[Cases]

(P = present)

AFRICA							
Algeria	91	32		4			
Basutoland	5	1					
Belgian Congo	59	43	6				
British East Africa:							
Kenya [1]	19	4					
Egypt	58	105	29		2		
Eritrea	15	5	5	1			
Gold Coast	2						
Libya	74	103	7	14	17	12	
Morocco (French)	43	11					
Morocco (Spanish)	[2] 1	1					
Mozambique		2					
Nigeria	2						
Rhodesia (Southern)	1						
Senegal	[2] 1						
Sierra Leone	[3] 3	[3] 2					
Somalia	1						
Tunisia [1]	230	159					
Union of South Africa [1]	139	P	P	P	P		
ASIA							
Burma	5						
China [1]	39	12					
Indochina (French) [1]	6	10				4	
Iran [1]	51	20	3				
Iraq	51	28	15	11	5	1	
Japan	237	156	11				

See footnotes at end of table.

TYPHUS FEVER—Continued

Place	January–March 1948	April 1948	May 1948—week ended—				
			1	8	15	22	29
ASIA—continued							
Manchuria	5						
Pakistan			5	16			
Palestine [1]	12						
Philippine Islands	[2] 1						
Straits Settlements	4	2	1	1			
Syria [1]	13	2		4	8		
Trans Jordan	20	10	3	3		2	
Turkey (see Turkey in Europe)							
EUROPE							
Bulgaria	346	198					
Czechoslovakia	5	1					
France		1					
Germany	4	1			1	1	
Great Britain Island of Malta	[illegible]						
Greece [1]	47	8		3	1		2
Hungary	48	8	2		2		
Italy [1]	21	21			[3] 13		
Sicily [4]	5						
Netherlands	[2] 1						
Poland	90	40			2		
Rumania [1]	19 403	1 018					
Spain	1	1					
Turkey	159	39	6	10	4	2	
Yugoslavia	258	133		8			
NORTH AMERICA							
Costa Rica	1						
Cuba	8	1					
Guatemala	18						
Jamaica	2	3					
Mexico [1]	253	32	1	2		1	
Panama Canal Zone	1						
Puerto Rico	[illegible]	2	1		3		
SOUTH AMERICA							
Bolivia	[5] 13	36					[6] 41
Brazil	62	9	5	3			
Chile [1]	[7] 75			[8] 75	1		
Colombia	825						
Curaçao [2]	11						
Ecuador [1]	120	50					
Venezuela	28	12			[9] 24	1	
OCEANIA							
Australia [2]	75	10	5				
Hawaii Territory	2	3					
New Caledonia	1						

*Reports from some areas are probably murine type while others probably include both murine and louse borne types

[1] Includes murine type

[2] Murine type

[3] For the period May 1–10 1948

[4] For the period Dec 1–31 1947 16 cases of typhus fever were reported in Sicily

[5] Includes 9 deaths reported as cases

[6] For the period May 1–24 1948

[7] For the period Jan 1 Mar 6 1948

[8] For the period Mar 7–May 8 1948

[9] For the period Apr 18–May 15 1948

YELLOW FEVER

[C indicates cases D deaths]

AFRICA								
Ivory Coast								
Gagnao	C	1						
SOUTH AMERICA								
Colombia								
Antioquia Department	D	5						
Boyaca Department	D	1						
Caldas Department	D	2						
Cundinamarca Department	D	7						
Intendencia of Meta	D	3						

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued in reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. : 1948
For sale by the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. Price 10 cents. Subscription price $4.00 a year.